Working Paper

ISI / WP-3

September 1976

Design Considerations for a Computerized Message Service Based on Triservice Operations Personnel at CINCPAC Headquarters, Camp Smith, Oahu

John F. Heafner

Larry H. Miller

85   06   13   144

Working Paper

ISI / WP-3

September 1976

Design Considerations for a Computerized
Message Service Based on Triservice Operations Personnel
at CINCPAC Headquarters, Camp Smith, Oahu

John F. Heafner

Larry H. Miller

Accession For

NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	

By

Distribution/

Availability Codes

Dist	Avail and/or Special
A/1	

DTIC
COPY
INSPECTED
1

INFORMATION SCIENCES INSTITUTE

4676 Admiralty Way/Marina del Rey/California/90291
(213) 822-1511

Contents

3

Preface

The Defense Advanced Research Projects Agency (ARPA) and the Navy are presently sponsoring the development of interactive message processing services which are to provide the basis for a test of automated military message processing on Oahu in 1977. Prior to the experimental use of these services, information has been gathered as design inputs so that the resulting test services may more accurately reflect the needs and wants of the potential user community.

This report (sponsored by ARPA) presents findings of such an information-gathering exercise: a study of triservice personnel in Operations at CINCPAC Headquarters, Camp Smith, Oahu. The objective of the study was to identify necessary and desirable message processing functions, along with their syntactic representation and vocabulary. The functions so identified are enumerated here, along with the probable utility of each, as judged by the military personnel participating in the study. In addition to this input from potential users, the authors recommend various alternative implementation practices for many of the functional features. *Additional keywords: computer files; formats.*

The primary readership of this paper includes those persons designing and implementing test services at BBN, MIT, and USC/ISI, along with their clients ARPA and NAVELEX. The report is also intended for Operations personnel at CINCPAC, for their review and comment. The report is not intended for the uninitiated, hence much jargon (military and computer science) is used.

A Note to the Reader

A summary usually summarizes a report, giving its major conclusions, impact, and so forth. Because this report has limited distribution, we see its primary value as an input, a collection of weighted suggestions, to the three groups designing candidate test services. Such individuals need not a summary, but rather the details. We have shortened the report where possible, trying not to lose the essence of the collective military attitude toward each potential service feature.

An important part of the readership will not, however, actually be designing the test service. Rather than provide a separate summary for them, we provide the following advice: Read Chapter 1 (introduction) and Chapter 16 (conclusions). If a few more specifics are desired, scan the table of contents for material of interest. The last section of most chapters contains our interpretations and recommendations.

Acknowledgments

1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THE STUDY

This paper reports the results of a recent survey research study, employing triservice military operations personnel, conducted to gather information helpful in designing a user-oriented, automated message service. It was carried out during July, 1976. Methods used in the study were based in part on earlier research done by one of the authors [Heafner 75] [Heafner 76], and in part based on conventional survey research methods. The results obtained are reported here to facilitate the definition of a computerized message service that is most sutable for the majority of operations personnel in administration and in command and control. Specifically, this study, in conjunction with an earlier companion paper [Heafner 76], is part of a larger, ongoing test program. It is planned to help develop a natural and sufficient man-computer language and to accurately determine adequate functional processing needs.

The paper is intended as a working document for those fabricating the test services, and for those responsible for the overall test management. The main thrust of the study is to identify needed message service functions. The results also supplement the companion report in terms of language constructs for message operations.

1.2 SUBJECTS OF THE STUDY

Twenty-four subjects were interviewed in depth. They were chosen by CINCPAC randomly within a stratified (i.e., J3 Operations) sample to reflect the characteristics of a larger population of potential military users. For purposes of analysis and reporting, the subjects are placed in each of three categories.

CATEGORY 1: J3 Operations (i.e., all subjects)

SUBJECT RANK	NO. OF SUBJECTS
CAPT	1
SSG	2
TSG	2
SFC	2
LTCDR	6
MAJ	1
CDR	4
PFC	1
YN1	2
MSG	1
COL	1
LTCOL	1

CATEGORY 2

SUBJECT DESCRIPTION	NO. OF SUBJECTS
Enlisted personnel, message distribution	3
Enlisted personnel, action officer support	7
Action officers	13
Senior officer	1

CATEGORY 3

SUBJECT DESCRIPTION	NO. OF SUBJECTS
Enlisted personnel	10
Officers	14

Although our recommendations and conclusions are based on 24 subjects, the statistics represent only 22. Two subjects were interviewed together, at their request. This violated a situation variable which we wished to control. Consequently, their responses are not considered in the statistics. However, their responses are indeed considered in our recommendations and their dialogues appear in the report.

1.3 FORMAT OF THE STUDY

The study began with introductory remarks by the interviewers to provide a setting for the question/answer portion which followed. The setting is best described by including here the notes used as introductory remarks. They follow in italics.

We're from the University of Southern California and we are working with the Advanced Research Projects Agency in Washington and military communications people both here and in Washington, to develop an automated message service. The message service that we are planning is a completely automated writer-to-reader service incorporating message composition, transmission, receipt and archival. This service will be installed here for a test throughout 1977.

The reason we have asked you to help us is that we want to find out how you process messages, and determine what styles of communication you would like for a computerized service, that is, what kind of features would be necessary, how you would like to instruct the computer ser- e to carry them out, and what vocabulary words seem natural and convenient to you. We believe that we can build a much more useful service if you and others who actually process messages will help us design the service.

In order for us to learn some of these things from you, we'd like to ask you some questions and get your opinions on some of the tentative plans we now have for the service. What we hope to learn from these questions is just how you would like to process messages automatically. So feel free to make comments at any time as we go along. That is, mention anything you might think of that we've omitted or anything that we're doing wrong.

Before we ask the questions, let me go through a scenario that illustrates the kind of service we think would be suitable for your use here. The reason for going over this scenario is to provide a context or setting for the questions, so that you'll understand what we think we know, and don't know.

The scenario illustrates the nature of message handling practices using an automated service and it is based on conversations with military communications people in Washington and here.

The user logs onto the service in the morning from his CRT terminal (Fig. 1-1) located in or near his office. After he has typed his identification, the service automatically displays excerpts of messages awaiting his attention, sort of a table of contents (Fig. 1-2). These include messages for his information or action, drafts for his review and chop, incompleted drafts which he is composing, and so forth. This display of excerpts of messages and drafts we call his PENDING file.

Let us suppose he wishes to read a particular incoming message. Since each excerpt is numbered, he indicates his desire to see the message merely by pressing a button on his keyboard marked DISPLAY and then typing the number which is adjacent to the desired message. This causes the message to be displayed on his screen (Figs. 1-3a, 1-3b). Although the entire message may not fit on the screen at one time, by pushing scroll up or scroll down keys, the user may scan all of the message.

If he feels he will want to refer to this message again, or if it is relevant to other messages of interest over some period of time, he may file the message in one of his personal files. For example, it may be of interest to him, say, in terms of its originator, a location to which it applies, and a type of equipment that is described in the message's body. He tells the service by pressing the FILE button that he wishes to file the message in other than in his PENDING file. He types the name of the personal file, along with the location and the equipment type, as keywords for retrieval. He may later recall the message by naming the file and any of the appropriate keywords or the originator of the message.

One special form of file, a readboard, provides read access for a group of individuals. Since the readboard is always maintained inside the computer, many users may access that board simultaneously.

A user may wish to forward a message to some other user in the organization for his attention or action. Two keys allow the user to forward a message for action or for information. The distribution field of the message is automatically updated to reflect this additional distribution information.

Please type your identification.
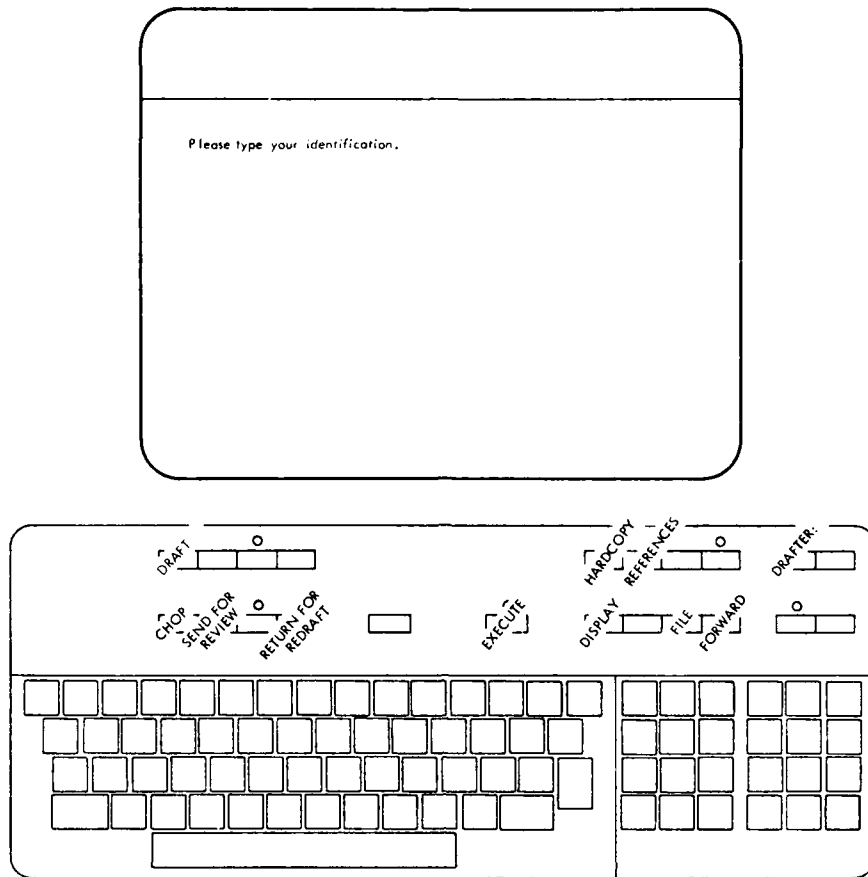
Fig. 1-1   Terminal Display and Keyboard

File: PENDING

1. Secret Immediate Action 200146Z July 76 NAVSEEACT Korean Operations

2. Unclass. Routine Info. 192723Z July 76 CINCPACFLT Korean Operations
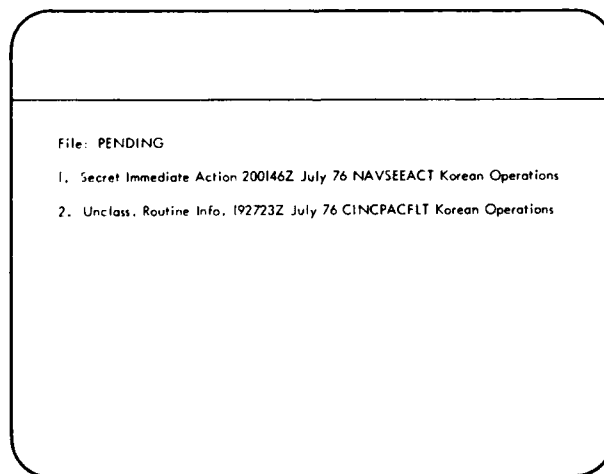
Fig. 1-2   Message Excerpts in PENDING File

Perhaps prior to forwarding or filing a message, the user would like to add a note, either to the message or the file in which the message is to be placed. The service allows the user to specify where such a comment should go and who is allowed to see it, in case it is not a public statement.

He may also wish to respond to an incoming message. If he wishes to get hardcopies of those messages referenced in the displayed message, he presses the buttons labeled HARDCOPY and REFERENCES. Perhaps there are other data or messages which he has in a personal file which he feels are needed for reference in responding to this message. Again, he uses the display button and types the file name along with any specific qualifiers that identify the messages of interest. For example, he might type "from CINCPACFLT." Those messages that he has selected are excerpted and displayed. If he wants a hardcopy of a particular message for reference, he presses HARDCOPY and types the number adjacent to the message excerpt.

Suppose he has composed the reply using pencil and paper and given it to his secretary. To enter the new draft on-line, using her terminal, the secretary presses the DRAFT button. A blank message form is displayed. With button controls and keyboard, she enters and edits the draft. She enters the codes for offices who should review the message prior to release. Parallel and serial routing to reviewers are indicated by the use of separate lines.

Let us return to the user who is presently reviewing, on-line, a draft message he has received for chop. Suppose other traffic arrives while he is reading this draft. He is alerted to this fact by an informative notice appearing in a special area or "window" at the top of his display. He may chose to preeempt his current activity and deal with the new message immediately, or he may decide to continue with the present work and handle the new traffic later. This time, he chooses the latter. He finishes reading the current message and approves it. He indicates his approval by pressing the CHOP button. When he has taken this final action on the draft, his PENDING file excerpts are again automatically displayed. The message to which he was earlier alerted, and chose to ignore, is now excerpted and specially marked to indicate its newness of arrival.

Perhaps the newly arriving message was a draft of his own, returning from chop for redraft. In this case, the alert indicates this. Using the DISPLAY button, he may ask to see the simultaneous display (on different areas of the screen) of both his original version and the edited version which was reviewed. With control buttons he may scroll the message to examine the parts of interest. Let us assume that proposed modifications are minor, and since it is not necessary to retype the entire message he makes the corrections himself. He then sends it back for chop, using the SEND FOR CHOP button.

This scenario should give you some idea of our thinking. Now, we want to ask some questions to determine how we can modify this service for your use. We have two kinds of questions. One kind is a closed-ended question where we simply want you to comment on certain proposed features of the message service. We want you to tell us if the feature is really good or really bad or somewhere in between. We would like for you to use this scoring scale to rate features of the service (Fig. 1-4). (The scoring scale was explained at this point.) The other kind of question is a discussion question where we want to determine your requirements and desires, and here, we wish to learn more about your current procedures.

```
UNCLASSIFIED              R 200146Z Aug 75
ROUTINE

From        CINCPACFLT MAKALAPA HI
To          CINCPAC HONOLULU HI
            DCA PAC KUNIA HI
            COMUSKOREA SEOUL KS
Info        FICPAC PEARL HARBOR HI
            DCA KOREA SEOUL KS

UNCLASSIFIED// N03000//
Subject     IDHSC CKT NDID 2533 TO COMUSKOREA
Reference   A.  CINCPACFLT 1323572 AUG 75
            B.  NAVSEEACT JAPAN 040726Z AUG 75 (NOTAL)
Text
I.  FICPAC IDHSC SWITCH PERSONNEL ARE COMMENDED FOR OUTSTANDING
INITIATIVE AND RESOURCEFULNESS IN RESOLVING COMUSKOREA IDHSC CIRCUIT
GARBLE PROBLEM (REF B REFERS) IN A TIMELY AND ECONOMICAL MANNER.
THIS FICPAC ACHIEVEMENT IS LATEST OF MANY EXAMPLES OF FICPAC
CONSISTANTLY OUTSTANDING OPERATION OF PACOM IDHSC/COINS NETWORK
SWITCH.
***************************** Internal Distribution********************************
Action      J6
Info        J0I, J2, J3, DDO
```

Fig. 1-3a   Example Message

```
Unclassified      [Drafter]  J312  191436Z AUG
[Action Precedence] P-Priority   [Info Precedence]
[From]            CINCPAC HONOLULU HI
[To]              COMUSKOREA SEOUL KS
                  NAVSEEACT JAPAN YOKUSUKA JA
                  DCA PAC KUNIA HI
                  CINCPACFELT MAKALAPA HI
[Info]            FICPAC PEARL HARBOR HI
                  DCA KOREA SEOUL KS
                  IST SIGNAL BRIGADE SEOUL KOREA
[Xmpt]
Unclassified/J312/J3 SENDS
[Subject]         IDHSC CKT NDID 2533 TO COMUSKOREA
[Reference]       A.  CINCPACFELT 132357Z AUG 75
                  B.  NAVSEEACT JAPAN 040726Z AUG 75 (NOTAL)
[Text]
1.  FICPAC IDHSS SWITCH

[Declassification]  GDS
*******************************Internal Distribution*******************************************
[Review]          J311, J313
                  J31
                  J32
                  J33
                  J1, J2, J6
[Releaser]        J3
[Distribution]    J4, DDO
```

Fig. 1-3b   Example Message

+3	It is a necessary requirement.
+2	It is highly desirable and useful.
+1	It is useful and desirable.
0	It is acceptable.
-1	It is not useful nor desirable.
-2	It is highly undesirable and not useful.
-3	It is in conflict with requirements or procedures.

Fig. 1-4   Rating Scale for Features of the Service

Subjects were asked both closed-ended and open-ended questions. In the case of closed-ended questions, each respondent was asked to numerically rate or score various message service features on the scale shown in Fig. 1-4. These were not completely closed-ended questions in that the respondents usually amplified and justified their ratings. With open-ended questions, the respondents were asked to discuss or elaborate some current procedure or organizational concept. These generally led to a short dialogue or discussion between the respondent and the interviewers.

1.4 THE FORMAT OF THE REPORT

The format of chapters 3 and 5 through 15 is as follows. The first section provides an explanation to the reader of the nature and intent of the questions in that chapter. The questions and answers follow. For each, a narrative is given, in *"italics,"* as it was presented to the respondents. (The questions as they appear in these chapters were actually taken from one of the taped sessions.) Next, a statistical summary of that question is given, followed by samples of dialogue between the respondents and the interviewers, substantiating the statistical results. At the end of each chapter, the authors' interpretations and recommendations are stated. In many cases, we give two recommendations: that considered essential, and a more elaborate facility deemed useful.

And now, a bit more about the statistics appearing in most chapters. The statistics reported for each of the rating questions are the mean, the mode and the standard deviation. The meanings and interpretations of these statistics are best described in reference to one of the questions asked each subject. Figure 1-5 represents the distribution of answers to the following question:

In your particular job function you may usually look at certain parts of the message first and then look at other parts of lesser interest later. So, one facility that we could provide is to allow you to specify the parts you want to see first. Then we would rearrange the parts of every message for you, so that every time you ask to display a message it would appear in the format you want, rather than the standard DD-173 format. Would that be useful or not useful to you?

For each of the possible response ratings (-3 to +3), the number of respondents actually giving that rating is diagrammed. That is, one person gave a rating of -3, three persons said -1, and so on, up to three persons rating the feature +3, as shown in Fig. 1-5. The *Mean* is just the average of all the responses. The *Mode* is the answer most frequently given. It is the rating corresponding to the "high point" of the frequency distribution. As such, it is a very important statistic where the data represents attitude responses of people. The *Standard Deviation* represents the spread of the scores. Approximately two thirds of all respondents answered within plus or minus the standard deviation (about 1.6 in our example) of the mean (about 0.7 in our example). A large standard deviation represents responses which are quite spread out. There would be a greater diversity of opinion on the particular question. A small standard deviation, conversely, represents a greater uniformity of opinion on the particular question. It is the authors' opinion that these three statistics, coupled with the frequency distribution graphs, provide a useful guide in determining the relative importance and utility to the test subjects of a particular service feature.

```
code
     I
 -3. ****** (      1)
     I
     I
     I
 -1. ****************** (      3)
     I
     I
     I
  0. ********************************** (      5)
     I
     I
     I
  1. ********************************** (      5)
     I
     I
     I
  2. ******************** (      3)
     I
     I
     I
  3. ******************** (      3)
     I
     I
     I
     I
     I........I........I.........I........I........I
     0        2        4        6        8       10
     frequency
```

MEAN   0.700   MODE   0.000   STD DEV   1.559

VALID CASES   20   MISSING CASES   2
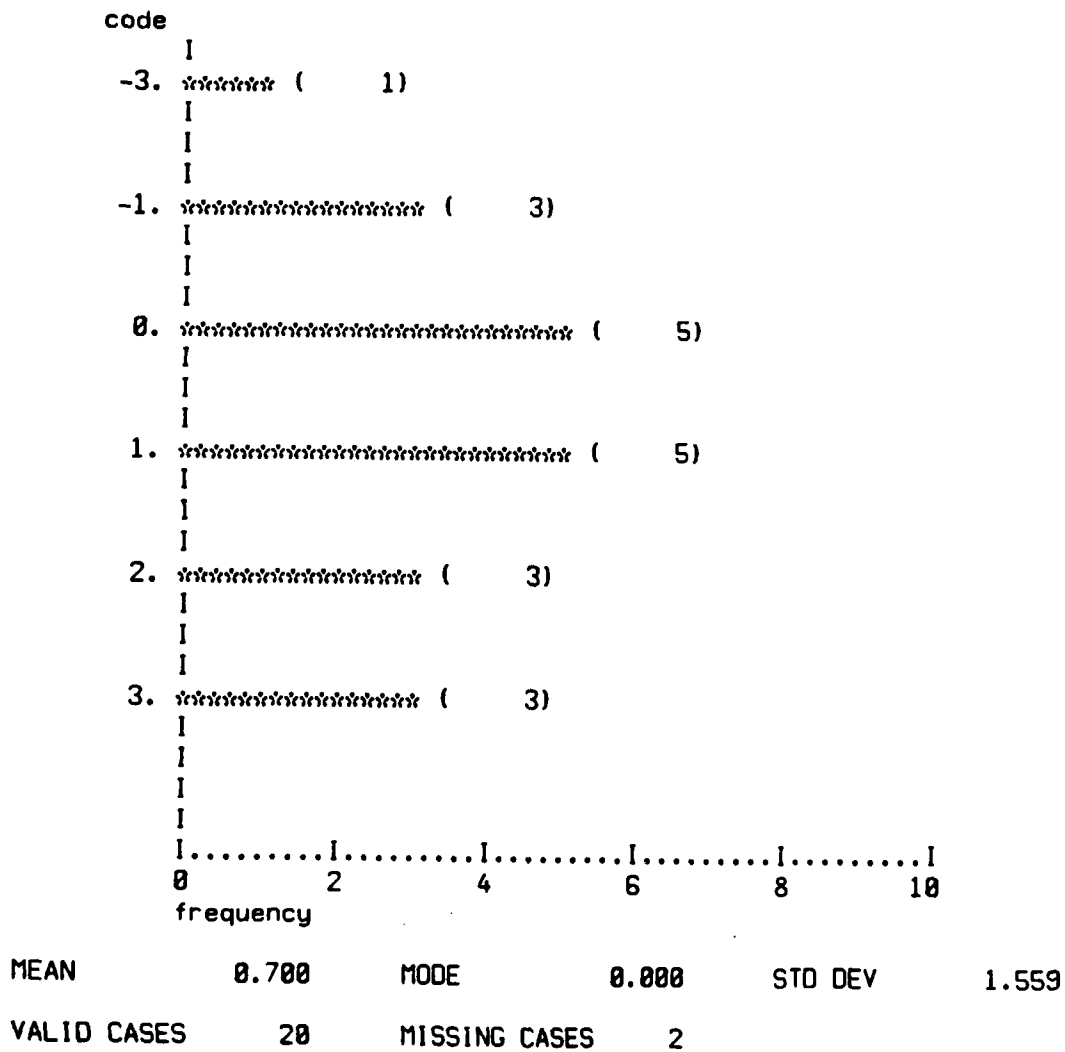
Fig. 1-5   Ratings for Field Reordering Capability

It was indicated above in the description of the subjects of this study that subjects represent enlisted personnel in administration, enlisted personnel supporting action officers, and officers. In some cases the mean response of one group of subjects to a question was different from the response of another group. For those questions to which there was a significant response difference, the frequency diagrams and statistics for the contrasting groups are presented. This information is of use to system designers because it breaks apart the response to a particular question and makes it possible to identify a subgroup of respondents for whom a particular function or feature is particularly desirable or particularly undesirable.

2. MESSAGE HANDLING PRACTICES OF J3 OPERATIONS

Before we examine the remarks of J3 personnel in detail, it might be helpful to some readers to succinctly portray some of the more prominent job functions affected by the 1977 message processing experiment. Interviewed were both officers and nonofficers in J3 Operations whose duties spanned administration, command watch, and action officer's functions.

With respect to the test service, the administration personnel are tasked with two main responsibilities. One responsibility is to assign action for incoming messages in two ways. When they are familiar with the subject matter, they assign the action directly for the appropriate directorate. If the subject is unfamiliar, they use a card catalog indexed on subject to compare with the subject of the message. For each subject entry in the catalog, a distribution list is appended, showing primary responsibility for that subject matter.

Respondent: We go by subject of the message. We have a card file by subject which shows who is action and who is info. If it is a subject we handle every day and we are familiar with it, then we automatically know where to assign it, but if it is not familiar then we look on the card file.

Respondent: We stamp it ACTION and put it in his box, he comes by and picks it up about every two hours.

In terms of routing and action assignment, an associated service provided by administration helps complete paper work for rerouting misdirected messages.

Respondent: I just send it back down to the admin section and tell them it is not for me and who I think it should be for.

Respondent: I call down to 301 and give them the date-time group and the originator. That's all they need. "That's been sold, transfer to J--." They make out the paper work. Then that message will come out of the computer again, sometime later, showing this change.

The second major service provided for the other directorates by administration is to maintain all messages, incoming and outgoing for some time for purposes of later retrieval. Much of their time is spent in such message retrieval.

Respondent: For example, we'll get a call from ----- wanting a SPECAT message, and the only thing he will know is the approximate date-time group (month or week) and from Admiral so-and-so. So, we'll have to review every SPECAT message.

The command watch team, manned 24 hours a day, must be immediately responsive to incoming traffic.

Respondent: We get every immediate and flash message at the same time the comm center gets it. The reason the command center exists is to act on messages as they come in. A perfect example was the Mayaguez. We got the first flash critics, and within minutes we had people in action.

After normal working hours, they provide backup for staff agencies.

Respondent: For J4 messages of immediate or flash that arrive after hours, we call them from the command center. If it is immediate or flash, right down at the bottom it says "notified at." We enter there who we call and the time.

Also, the command watch team constructs readboards for morning review.

Respondent: I make up General -----'s readboard from 1500 in the afternoon until 6:00 in the morning.

The action officers are both recipients and originators of message traffic.

Respondent: When you deal with JCS, they task you with a particular item and then you in turn go out to your subunified commands. They respond to you, and you in turn go back to JCS to terminate the project. So you're generating all the inputs from PACFLT and PACOM to respond. You could terminate it by going directly back to JCS if you had the current data to answer them. But if you have to go out into the PACOM to get it, you could generate up to 150 messages.

Messages are closely intertwined with other forms of correspondence and documentation, vital to the functioning of these action officers.

Respondent: There are a number of documents that we use, that are JCS documents, DIA appraisals, reports, things of this nature -- things other than messages, which I presume want to be in the system.

Respondent: My files are not strictly messages. They contain survey reports, inputs by mail, memos, and so forth. So, these are some of the things that could be looked at. They are all part of preparing messages.

3. MESSAGE FORMATTING AND HIGHLIGHTING

In planning an on-line, interactive service for any application, one tries to use to advantage those features inherent in an *interactive* facility. One such feature is the ability to quickly reconfigure information, for display, in a variety of ways. This general notion gives rise to particular questions about formatting the basic unit of information in this service -- the message. Would it be advantageous for a user to determine the arrangement of messages displayed to him? Specifically, would he like to be able to specify the order in which the various parts of the message appear when displayed? Furthermore, in regard to the message's appearance, would it not be useful, in terms of reducing a cluttered appearance, for him to be able to visually suppress parts of the message that are generally of little or no interest to him? How should this suppression be controlled?

User control over the presentation of a message is the subject of this chapter. Because the message is logically divided into parts, because the electronic manipulation of text is rather fast and straightforward, and because there may be large individual differences in user's opinions as to how they would prefer to see a message, information was gathered relative to the above questions.

3.1 REORDERING PARTS OF THE MESSAGE

3.1.1 The Question of Reordering

The first few questions deal with the form or appearance or format of a message. In your particular job function you may usually look at certain parts of the message first and then look at other parts of lesser interest later. So, one facility that we could provide is to allow you to specify the parts you want to see first. Then we would rearrange the parts of every message for you, so that every time you ask to display a message it would appear in the format you want, rather than the standard format. Would that be useful or not useful to you?

3.1.2 Analysis of Responses to Reordering

Considering all subjects, reordering rates only acceptable, with a mean = 0.7, std. dev. = 1.6, and mode = 0. There were two significant differences when the means of subgroups were compared. The differences in responses between enlisted personnel (Fig. 3-1) and officers (Fig. 3-2) were significant. The enlisted personnel rated reordering as desirable. Even more significant was the differences in responses between enlisted personnel in administration and action officers. *Enlisted men in administration rated reordering highly desirable* while action officers rated it acceptable.

```
                 code
                   I
              -1.  ****** (      1)
                   I
                   I
                   I
               1.  *********** (      2)
                   I
                   I
               2.  **************** (      3)
                   I
                   I
               3.  *********** (      2)
                   I
                   I
                   I
                   I
                   I.........I.........I.........I.........I.........I
                   0         2         4         6         8         10
                   frequency
```

MEAN   1.625   MODE   2.000   STD DEV   1.302

VALID CASES   8   MISSING CASES   1
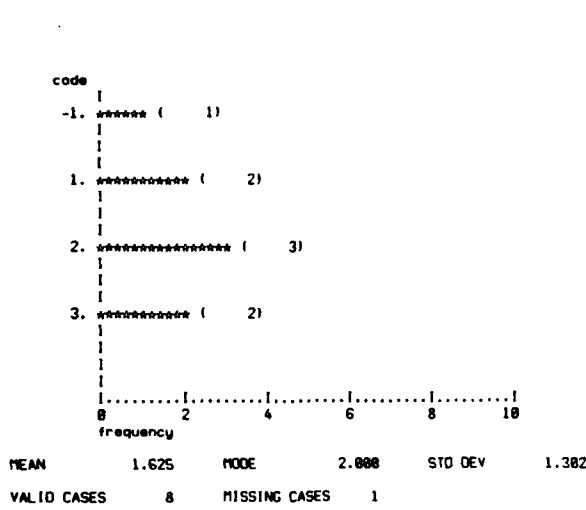
Fig. 3-1 Ratings for Reordering of Message Fields: Enlisted Personnel

```
                       code
                         I
                    -3.  ****** (      1)
                         I
                         I
                    -1.  *********** (      2)
                         I
                         I
                     0.  ****************************** (      5)
                         I
                         I
                     1.  **************** (      3)
                         I
                         I
                     3.  ****** (      1)
                         I
                         I
                         I
                         I
                         I.........I.........I.........I.........I.........I
                         0         2         4         6         8         10
                         frequency
```

MEAN   0.083   MODE   0.000   STD DEV   1.443

VALID CASES   12   MISSING CASES   1
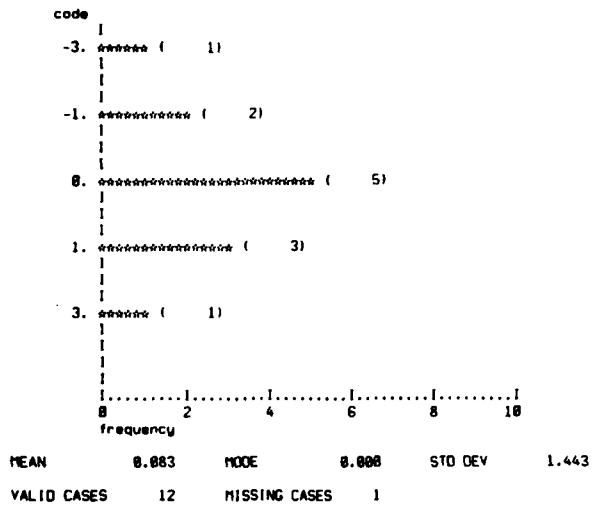
Fig. 3-2 Ratings for Reordering of Message Fields: Officers

3.1.3 Remarks Supporting Field Reordering

Respondent: It is somewhat useful.

Respondent: I would like to see the subject line first.

It is the authors' impression that these respondents wished to see the subject in order to perhaps postpone reading the body of the message until a more convenient time. Alerting had not been discussed at this time. The following respondent (who rated both reordering and suppression as zeros) states the equivalent.

Respondent: ... whereas, if you're expecting a reply, perhaps you are waiting for something from a component in order to make up a package to go to a higher headquarters, you might be looking for a particular subject to come in. You'd want to run through, perhaps, your PENDING file, looking just at subjects, and then go to the main body of the message.

3.1.4 Remarks Opposing Field Reordering

Respondent: It is difficult for me to believe that each one of us should have our own specific desires on how a message should be sent to us. Standard formatting, I think, is essential.

Respondent: It's awfully hard to kick an old habit. I think it would "blow my mind" to see something all turned around.

Respondent: The way the message comes in now is the appropriate way. It is not useful.

Respondent: I don't think there would be any variance from the standard.

Respondent: The only part that is of minor interest and could be omitted on first viewing is the internal distribution. But I like the message the way it's displayed here (Fig. 1-3).

3.2 VISUALLY SUPPRESSING PARTS OF THE MESSAGE

3.2.1 A Question on Field Suppression

Another similar feature that we could provide is to allow you to visually suppress certain parts of the message. That is, in order to reduce the cluttered appearance of your display, you could indicate those parts that are not normally of interest to you, and then they would only be shown to you on request. How would you rate such a facility?

3.2.2 Analysis of Responses to Field Suppression

By and large, the subjects held about the same opinions of the utility of visual suppression as they did about the utility of reordering. *The group as a whole rated suppression acceptable*, with a mean = 0.4, std. dev. = 1.0, and mode = 0. There was no significant difference among the subgroups.

3.2.3 A Question on Control of Field Suppression

Would you rather ask for specific parts to be unsuppressed and displayed, or instead would you rather ask for all of the suppressed parts to be displayed at once?

3.2.4 Analysis of Field Suppression Control

Of those persons favoring suppression, six answered the questions on how it should operate. Four wanted a binary switch and two preferred to type a parameter naming a particular field to be unsuppressed.

3.2.5 Remarks Opposing Field Suppression

Respondent: I can't visualize any benefit of that to me.

Respondent: I would rather see the whole message.

3.3 REMARKS IN SUPPORT OF HIGHLIGHTING MESSAGE PARTS

Highlighting message parts by higher intensity, underscoring, and so forth was not among the prepared questions, although the question did arise several times; sometimes it was prompted by the interviewer and sometimes by the respondent. In every instance, the respondent favored the ability to specify highlighting.

To provide context for the following dialogue, the subject had brought with him to the interview a stack of hardcopied messages. He occasionally scanned them to locate a particular kind in order to make a point.

Respondent: I've been on that job for so long that I can just look at a message and tell whether or not it is going to be of any interest to me.

Interviewer: What parts do you look at?

Respondent: I just look at the piece of paper. About 80% of the messages I can do away with because I know what a FIBIS report looks like, and I know what a DIA report looks 'ike. An OPREP 1,2, and 4 all look the same. I can tell a CIA report at a glance.

Interviewer: Basically, you glance at the total form and you know?

Respondent: Right. As I look at this message, the first thing I look at is right down in the middle. Because it was a standard message format I would have to read it. And the first thing I read was the subject line. So, I guess that is what I look at first.

Interviewer: It is the subject you look at rather than SSIC code or special handling?

Respondent: Right. I'm looking at a FIBIS report. It's always about Phnom Penh or Saigon, or Cambodian revolutionaries.

Interviewer: It seems that most of your messages would fit on the CRT as a single page.

Respondent: Right.

Interviewer: Since you are looking at the subject line in most cases, would it

be of any value to highlight that subject line in any way? By inverse video or higher intensity or something like that?

Respondent: That might be a good idea.

Interviewer: Have you seen inverse video or different levels of intensity?

Respondent: I understand the different levels of intensity.

Interviewer: With inverse video, the letters are white on a dark background which is just opposite of the normal dark letters on a light background. So the subject line would be just opposite of the remainder of the message. This is just another way, like higher intensity, to make the subject line more prominent.

Respondent: That might be a good idea. I thought about it last night, about what I examine. And when I do have to look at something, my eyes seem to focus on the first line of text or the subject line. Now I'm looking at what's called a RAINFORM. I have to look at it because there are two types out of all the many types that we get (and they all look alike) that I have to keep, and that I route to someone in the operation department. I look right in the middle of the subject line and I see the word -----. If it says ------ or ----- then I keep it.

Interviewer: Okay, so you're looking at flagwords as well as the subject line itself.

Respondent: Yes. I would say that most of the officers who work at that desk, after a while, are doing the same thing I'm doing.

Interviewer: So, there are parts of that line such as SSIC code that you are not interested in. You look at the subject itself and the flagwords. You might want only those parts highlighted?

Respondent: Yes. But in any case, don't rearrange anything.

3.4 INTERPRETATIONS AND RECOMMENDATIONS

A correlation analysis showed no significant relationship between the ratings assigned to reordering and those assigned to suppression. This indicates a lot of individual variation in preferences for message formatting aids. It is thus inappropriate to simply offer the users a collection of such aids.

Based upon the large number of "don't cares" as rated for reordering (mode = 0), and rather high variation (std. dev. = 1.6), *we do not recommend the ability to reorder.*

Likewise, suppression in the context of our question is not recommended. Most users wanted to see the message in its standard, familiar form. However, comments attached to specific fields of draft messages were deemed useful (see Chapter 9). If the comment feature is implemented, then we recommend providing a variation of the

suppression. Field-specific comments change the appearance of the message from its standard form. *Thus, we recommend a binary control which suppresses all or none of the comments, along with other status-like information not normally appearing on the present message form.*

Unfortunately, highlighting was not investigated with all subjects. Yet, it was discussed with more than half the subjects and each had a favorable reaction. *Highlighting is recommended.* The minimum recommendation is to provide a facility to highlight by higher intensity or inverse video those parts of the message that would include originator, subject, and flagwords. (These parts were most frequently identified by the respondents as the parts they observe first.) We suggest instructions to turn on and off the highlighting. This allows those users who do not wish to use this feature to ignore it. The effect of the instruction should be remembered (i.e., recorded in a user's profile) so that it does not have to be set for each message or for each time the user logs on. We also support a more elaborate arrangement in which users can name the message parts to which highlighting applies. For compatibility with other recommended forms, we would suggest that this appear as an editable list of message field names.

4. PRESENT MESSAGE FILING SYSTEMS OF J3 OPERATIONS

Some military messages are of transient interest, others have more lasting value. Consequently, many messages are maintained in files for varying amounts of time. The organization of, and access to, active files and archived files are extremely important design issues in any automated service. Filing and retrieving of messages and other materials constitutes a large part of the daily activity of many potential users of the service. Since filing and retrieving are of such importance, a considerable part of this study addressed file system issues, as will be seen here and in Chapters 5, 6, and 8.

To get a general feel for their present filing schema, we asked each subject to briefly describe his current filing arrangement. Their responses have not been analyzed in any sense; they are included to give the implementers a feeling for the sizes of files and the variety of filing needs. A summary of their comments follows.

4.1 A SUMMARY OF FILING ARRANGEMENTS

Respondent 1

There are four files, viz., SPECAT, Eyes Only, Classified, and Unclassified. Each file is arranged according to date-time group.

Respondent 2

This individual was mainly concerned with a SPECAT file in which messages are filed by DTG and maintained for six months.

Respondent 3

Four files are maintained by DTG. They are Action/Cog., Eyes Only, SPECAT, and Outgoing. Most requests for file copies of messages come in by DTG.

Respondent 4

Files are subject oriented.

Respondent 5

Several files are maintained by subject. Within each, messages are filed chronologically by DTG.

Respondent 6

This individual's remarks are quoted below.

Respondent: For my personal use, that (in reference to the general file system described in Chapter 6) would fit very well, because most of the things on the watch team are time-oriented. Everything is very quiet for two days and then suddenly something springs up, a problem that you have to work. So, you would be using the system you described, and when the problem was completed, you could store it all on magnetic tape. On the watch team, that time element is probably different from a staff agency, where they may have a longer period of interest.

Interviewer: How long do you normally work on a problem?

Respondent: It depends on the problem. A good example is the earthquake in New Guinea. The earthquake occurred last week. We'll get messages that kind of follow a bell curve. Things will start rolling along. Then, if they ask for aid, messages will start flying around and there will be airlift and coordination between various agencies in getting the supplies and the airlift, and you'll reach a peak there where lots of traffic is going back and forth. Then it will start tapering off. This will go over a period of perhaps two or three weeks.

Interviewer: What is the total volume of traffic in that period of time on a given topic?

Respondent: For example, the Guam typhoon, which might be unusual because of the extensive damage done, we had just a tremendous amount of traffic on that.

Interviewer: Hundreds? Thousands?

Respondent: In the hundreds. I had four folders on that. I personally had a file of four or five hundred messages on that.

Interviewer: You said that was not quite typical? It was a little heavy?

Respondent: Most of the problems we work don't get up that high.

Interviewer: You mentioned that it looked like a bell-shaped curve, the traffic density. Was that just a guess or has this been studied?

Respondent: That is just an observation. You get a build-up to the problem, a few preliminary messages requesting information. Some of them die right there. If it does continue, if it is a problem or requires action, then it takes off. And then at the end, after the action is completed, there are a few clean-up messages.

Interviewer: How many problems do you have active at any one time?

Respondent: Normally, the number of problems are not more than two or three. But I wasn't here back when Southeast Asia was still going. Right

now we have two things going in there. Sometimes everything happens at once.

Interviewer: Is there usually one problem rising as another is tapering off, so that your work load is relatively constant?

Respondent: No, usually it goes in spurts. Just going back to the Guam typhoon, I had six files of messages. For example, one was just the wind warnings put out by the weather service -- where is the typhoon now and what are the winds. Another, for example, was the typhoon condition declarations, like Japan is in four and Okinawa is in two and so forth; we have to keep track of all that. Another, say, was of the airlift: how many flights are coming from where and have they arrived yet, that sort of thing. So, as an example, that is just the sort of thing we need this kind of file system for.

Interviewer: How are the messages organized within one of these files?

Respondent: Normally, by date-time group. Subject files and within subject by date-time group. But I suppose that comes about by the way messages are manually filed. If you are filing and retrieving manually, then you want the most recent on top. In a computer, I don't know if you want to stick to that or not.

Interviewer: When you ask for summary information, the excerpts, perhaps you could get them chronologically. But there are other ways you can call for the information if you want just parts of it. We'll get into that in a few minutes.

Respondent 7

This individual was primarily concerned with readboards which are files made up each day.

Respondent 8

Files are by subject matter within a broad area of interest. There are about 15 subjects, and no organization within a file. Messages per file range from about 15 to 150. Retrieval is by subject, sometimes with the approximate DTG.

Respondent 9

Longevity of files is about three weeks.

Respondent 10

Messages are now retrieved by DTG, subject, and originator.

Respondent 11

Respondent: If I were going to use this system, I would have to be sure that I knew what files I had, from a title standpoint. It would be difficult to remember 20 or 25 different files.

Interviewer: How do you do it now?

Respondent: I'd have to have the title in order to be able to file a message.

Interviewer: One thing you might do is display the names of all your files. A file name might, for practical purposes, be as long as you want. In the file system we use, I have hundreds of files so my secretary gives them long descriptive names to easily identify them. But you aren't required to type the entire name.

Respondent 12

Messages are filed two ways: all outgoing in originator files, and both incoming and outgoing in subject files. There are about 50 subject files run by calendar year. Some would contain 1000 messages and others as few as 100.

Respondent 13

There are approximately 100 Navy files with 5-200 messages per file, and five or six subject files with 100 messages each. Again, we quote.

Respondent: The Navy uses Standard Subject Index Classification (SSIC). Actually, I've got three different sets of files because I've got three different shops back there that I take care of. I take care of Air, Ground, and Surface. The Navy has theirs by SSIC, the Air shop files by subject and date-time group.

Respondent 14

Forty or fifty subject files are maintained in this office. Messages range from 6 to several hundred per file.

Respondent: By subject title within year. We have several years of files. Current files are maintained for about a year. We maintain, but seldom use, history files.

Respondent 15

Messages are filed under title. The number of active files range from 6 to 70, and 30-minute access time is needed.

Respondent 16

Approximately 6 subject files of continuing interest are maintained. Within subject, messages are filed by DTG. We quote.

> Respondent: It depends. But I would say, of continuing interest, we may have half a dozen or so. However, there are some areas that we have worked in, where, when we see the message, we'll go ahead and file it. By the half dozen or so, I'm saying these are things we are watching on a day-to-day basis. And those half dozen are changing. We may dump them all at the end of the month, and start another one in another category. But work that we've done two years ago -- we may still be collecting traffic on that. So the number of files can run into hundreds.

Respondent 17

This subject presently has 358 files, strictly by subject, and within by action and miscellaneous. Messages per file range from 20 to 300.

Respondent 18

Messages are filed by subject, and by DTG within. Thirty to forty files are maintained with 1-300 messages per file.

Respondent 19

> Respondent: In our office we deal with day-to-day requirements as well as historical requirements files. We're typically responsive to the J3 day-to-day action board in that we're working current operations problems as well as current operations problems that impact on source documents that may be five years old, or six years old -- JCS SM's or something of that nature. So if we're talking of our filing system, not only messages but periodicals and SM's and that sort of thing, we have what we consider current files, that go back 7 or 8 years. It may seem a little bit unreal but a lot of things we operate on are printed one time and maintained as a current item. In fact, I was reviewing one this morning that was dated 1969, an SM. A lot of our day-to-day current activity is based on files that are 6 or 7 years old in the document area. Now, with regard to messages, in some cases we keep files of messages that are 2 or 3 years old. We have been known to have a 3 or 4 year old message that, in fact, was the only guidance we ever got on that particular subject. Sometimes the information is picked up in new SMs as they are published. We deal in nuclear safety. Guidance comes out in messages that references a particular SM and says, "This is an elaboration on a particular point that was discussed in the SM," for instance. We would maintain that file for 2 or 3 or 4 years.

Interviewer: How many active files do you have at any one time?

Respondent: If we're talking about specific subjects ...

Interviewer: Is that the way they are organized?

Respondent: Yes. Subject files. For example, the ----- bomb. If we break that down to the ----- bomb, of which there are innumerable kinds of bombs, we probably have in the neighborhood of 2 to 4 hundred files.

Interviewer: Each one would contain approximately how many messages?

Respondent: Somewhere between 4 and 12.

Respondent 20

Files are by subject and within by DTG. Presently there are approximately 15 current files plus historic files.

Respondent 21

Six to 10 files are maintained, with about 5 to 10 messages per file. They are subject files, sorted within by DTG. Large files are organized within by originating organization. We quote the subject.

Respondent: They are strictly manual. Messages and pertinent references are put into a manila folder. In most cases there is some classification that requires you keep it in a safe drawer that you might have all to your own use or you might share with another action officer. You keep correspondence that pertains to that subject with that folder until the action is completed, at which time you destroy the file. And if you ever need it in the future, you have to go to the LDMX master archive.

Respondent 22

Four files are maintained by SPECAT, Outgoing, Incoming and Eyes Only. In addition there are general correspondence files (about 10-15) by subject, which contain 2-150 messages per file.

4.2 AUTHORS' COMMENT

Other materials are integral to the message handling processes. This very important fact begins to emerge with the subjects' remarks in this chapter. We will revisit this notion many times throughout the report. Another noteworthy observation is that active file storage requirements do not appear to be excessive, for J3, in terms of modern secondary storage mediums. Many users are referring to the same messages; some of the respondents are describing the same file. For example, three respondents represented J3 administration, and their descriptions referred to a common file system.

5. A GENERAL AUTOMATED FILING SYSTEM

Our earlier study in Washington gave rise to a general organization for filing and retrieval. This file organization, based upon the opinions of the Washington Navy personnel involved in the earlier study, was presented to the subjects. Our objective was to determine if it had wide enough application to cover the needs of the Oahu personnel who will be using the test service next year.

5.1 A PROPOSED FILING SYSTEM

5.1.1 Overview Presented to the Subjects

We envision an electronic filing system that is conceptually similar to a filing cabinet in that you can have any number of files, and any of them can contain an arbitrary number of messages. Earlier, we mentioned the PENDING file, which automatically traps all your incoming traffic. Now in addition, you can have any number of personal files that you want to define, and we've given some examples here (Fig. 5-1) with subject names. You may organize according to subject, or organize according to action, cog., info., or whatever you desire -- any arrangement you like. Additionally, there are a number of files that may be accessed by more than one person: as examples, the daily digest and readboards. In addition to the types of files seen here, there is a master archive that will contain a copy of all of the released messages, not just J3's, but all of them. It would be accessed on the originator and date-time group. Now, in addition, associated with each one of your personal files and group files, there is a special separate archive file, so that you can clean up your active files and put messages in an archive. You still retrieve messages on the same basis that you would retrieve from an on-line file. What you have now, in fact, is a master archive. You go back through LDMX to retrieve an old message if you don't have a hardcopy of it. And you either give them the control number or the originator and date-time group. Something on that order? We have some easier ways, and we hope you can do it yourself, directly. We'll get into some of those in a few minutes.

The kinds of things that you can do with these files is, of course, to put messages into them, and take messages out for display or for making printed copies, for opening up other offices, archiving and unarchiving, and so forth. The master archive will be updated automatically: every incoming message will be copied into the master archive. You can have the service automatically clean up your personal files for you, based on certain criteria, or you can do it explicitly yourself. And in a few minutes I'll describe some features and let you decide which way you'd prefer to do that.

With these files, you can extract only a part or a subset of the file that's of interest to you. For example, let's say that you have a personal file labeled SPECAT containing your SPECAT messages, and you only want to look at those that were originated by PACAF. You could extract only those headers, or the messages themselves, of interest to you, instead of looking at the entire file. We have some ways of doing this, to hopefully specify a particular message in a file of maybe several hundred. We'll talk about that in a few minutes.

5.1.2 A Question on the General File Organization

The first thing I'd like you to do, though, is to rate numerically this general file organization as to its adequacy for your needs.

5.1.3 Analysis of Responses to the General File Organization and Operation

Responses to the general description of an automated filing system are shown in Fig. 5-2. *Approximately half of the subjects felt that this capability was highly desirable, and approximately half stated that it was essential.* Note the most common reply (mode = 3) was "necessary." Note also the low variation in responses (std. dev. = 0.8).

5.2 READBOARDS AND OTHER GROUP FILES

There was no numerically rated question for readboard organization. To those who use them, they are essential; to those who do not, they are not needed. Our objective was to ascertain the composition and use of readboards.

5.2.1 A Question on Files Requiring Special Handling

What are the kinds of files you deal with that require special handling? And what are the special features of each? For example, if the action log were a file, it would have specially formatted entries, different from messages, and part of each entry could be filled in automatically by the service.

5.2.2 Remarks on Special Files

Respondent: The daily digest contains incoming documents and efficiency reports. Anything with a suspense date they pick up for the digest. As far as messages go, it could be a file.

Respondent: I'm thinking of the watch team requirements versus the staff agency requirements. I build three readboards myself.

Interviewer: When you are building them, do you look at a message and then decide to put it on one board or another?

Respondent: Right. I have General ------'s and Colonel -----'s and Colonel -----'s. Every message that comes in goes across my desk. I make a determination if that message should go in any or all of those readboards.

Interviewer: So, it might go on more than one?

Respondent: Yes.

Personal Files

PENDING   PROCUREMENT OPERATION   RETROFIT

Group Files

READBOARD   ACTION
             LOG

Fig. 5-1   Example Files

```
code
     I
  0. ******* (      1)
     I
     I
     I
  1. ************** (      2)
     I
     I
     I
  2. ************************************************** (      9)
     I
     I
     I
  3. ************************************************** (     10)
     I .
     I
     I........I........I........I........I........I........I
     0        2        4        6        8       10
     frequency

MEAN          2.273    MODE        3.000    STD DEV     0.827

VALID CASES     22     MISSING CASES    0
```
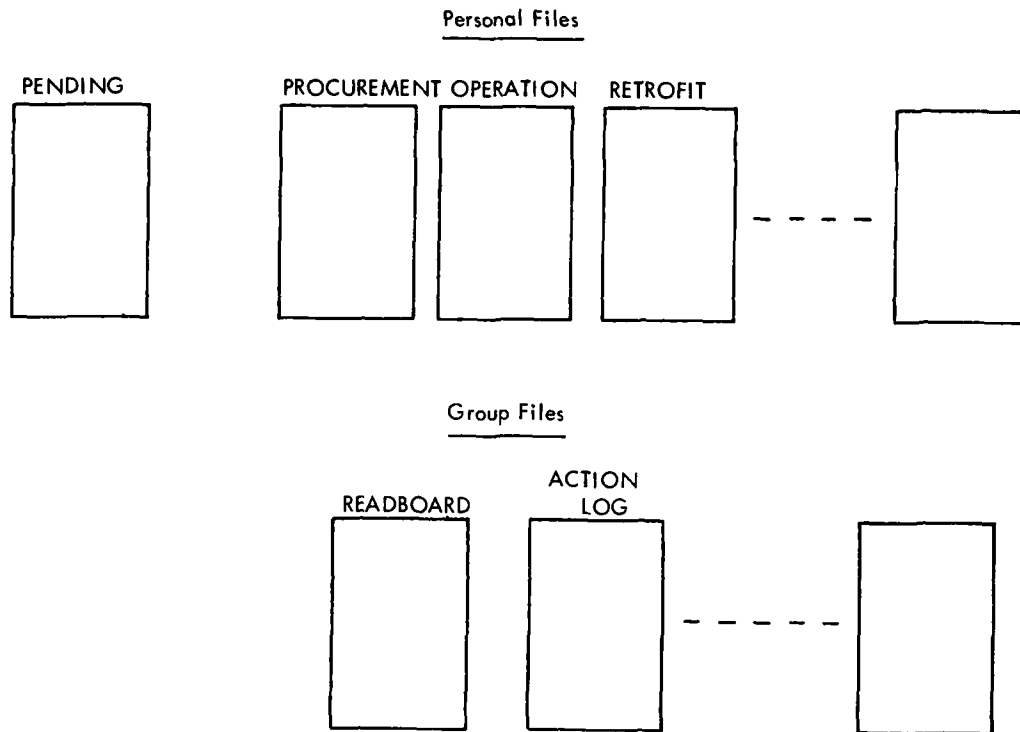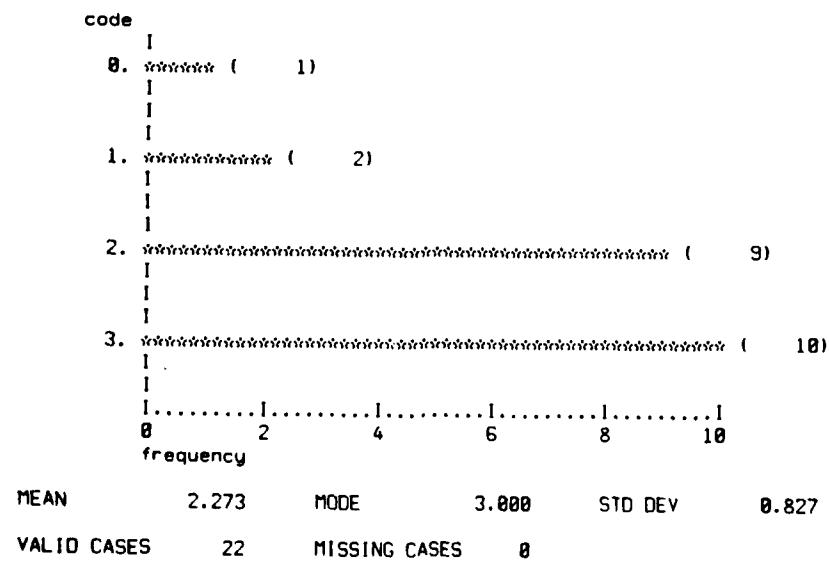
Fig. 5-2   Ratings for General File Organization

Interviewer: Is that based on the subject line of the message?

Respondent: Normally, the readboard is divided into sections. Certain things will go in without my determination. They automatically go in or they do not. For example, OPREP-3 is a message of command interest that comes up from subordinate units; every one of those will go in.

Interviewer: Is OPREP-3 a message type?

Respondent: Yes.

Interviewer: Is it on a different form?

Respondent: No. It's on the same form, it is just a flagword.

Interviewer: So, you pick that up from the first part of the text?

Respondent: It's in the subject. There might be additional flagwords, like "pinnacle", which means it goes all the way to the top.

Interviewer: Is there any information, other than the subject line, that you use in determining on which readboards it should go?

Respondent: That's interesting. Dealing with this volume of messages, I suppose everyone develops their own technique. I try to look at the subject line and down at the bottom where the computer has flagged it for J3 action or cog.

Interviewer: So you look at action assignment as well.

Respondent: Yes. The reason I look at the subject is because the readboards are sectioned. Section one is OPREP-3 and locator bulletins, section two is SPECAT messages, section three is J3 action/cog, section four is then messages other than J3 action/cog that would be of interest to J3.

Interviewer: You mentioned SPECAT. So you are also looking at special handling codes. That is also a part of the first line.

Respondent: Yes. *But those presently come on pink paper rather than white, so I know immediately.* Other than the J3 action/cog, I look at the subject and if it is something that is current or hot, although the message is not flagged for J3, I know. Or the DDO knows, because he goes to all the daily briefings. He chooses more of those because he is in the mainstream and knows what's of current interest to the J3 staff. For example, there might be something put in there today that you wouldn't have put in yesterday, whereas tomorrow they may not want to read about it.

On my team, the DDO also gets a copy of all messages. He also determines messages that are not J3 action or cog, but that would be of interest to the J3 staff. So he gives me a copy and I put it in the reading board. Sometimes, he'll put one in just for General ----- or Colonel -----. So, we're both reading the subject.

Interviewer: How big are these three readboards?

Respondent: It varies with the volume of traffic. Normally, I'd say around 50 messages. We're doing this after duty hours. From three in the afternoon until six in the morning, we build readboards. Through the day, the distribution is made through the agency itself.

Interviewer: How long does a message stay there?

Respondent: Just until they read it. For example, Colonel ----- comes in at 4:30 or 5:00 in the morning. He goes through them and highlights things that he thinks would be of general interest.

Interviewer: Who takes the messages off the readboards?

Respondent: After they have finished with it, their clerk will bring it back to me.

Interviewer: They've indicated on there what should be deleted?

Respondent: No. I just throw them all away. The only value of those messages was for them to read. There are other copies for them to file.

Interviewer: It is just a one-day activity?

Respondent: Yes. Now sometimes the General or the two Colonels might see a message they want to flag back to the DDO. For example, the earthquake message was pulled out and commented: "Watch this over the weekend" and it went back to the DDO. So sometimes the messages are pulled out of the readboards for actions.

Respondent: I make up General -----'s readboard. From 1500 in the afternoon until 6:00 in the morning. For the message traffic that comes to CINCPAC between those hours, it is the guy on my desk who decides what the General is going to see (when he comes in at 6:30 in the morning) from the afternoon and evening before.

Interviewer: Is this a single readboard?

Respondent: Yes, it is.

Interviewer: Do you make up copies for others as well?

Respondent: I make up three of them simultaneously.

Interviewer: Do you put the same things into each of them?

Respondent: Yes, with some very minor exceptions.

Interviewer: With an electronic readboard, would it be acceptable to make up just one and mark some items not of interest to certain individuals? Or would you s⸱ ⸱se three?

Respondent: As far as messages go, they all get the same messages. *It's some of the other stuff.*

Interviewer: What other stuff?

Respondent: *We have personnel locators, not in message form, that the EAs (Emergency Action Team) make up.*

Interviewer: What is a personnel locator?

Respondent: It tells where all the major people are. Each night the EAs work that up for the next day. If someone doesn't happen to be in the Headquarters, if they are on leave or something, it is indicated here, along with when they'll return.

Interviewer: This goes on a form?

Respondent: Yes.

Interviewer: And there is just one copy of it that goes on each of the readboards? Would it be possible for us to get a copy of the form?

Respondent: Sure. *We also have a few others that we make up -- status of our airborne command post airplanes, status of our TACAMO airplanes.*

Interviewer: Again, these are standard forms that you complete each day?

Respondent: Yes.

Interviewer: I would imagine that with some of these forms, such as the personnel locator form, it is already filled out with the names or codes and you just do minor editing on it each day.

Respondent: Right.

Interviewer: It is certainly possible to have that kind of form in the computer and you could edit it each day and put it in the readboards.

5.3 INTERPRETATIONS AND RECOMMENDATIONS

Twenty-two of 24 subjects were generally quite pleased with the basic architecture of the file system described. Our understanding, at this level, of their needs is precise enough. However, it is the details that will ultimately render the service useful or not. We are about to embark upon those details in the next few chapters. But let us not overlook the few important details uncovered in discussing the general organization. The first, italicized earlier, is that SPECATs are differentiated by color coding. Bordering or

some other form of electronic emphasizing is recommended for SPECATs, either all of them or at least those routed to the command center.

The next detail is very, very important. Readboards contain nonmessage forms, edited daily. Incorporating these forms should not be difficult nor time-consuming. The authors have earlier mailed copies of them to BBN, MIT, and USC/ISI. We recommend their inclusion. Quite a few subjects raised and reraised the issue -- the problem -- of preforming their daily functions using electronic message handling while at the same time using present manual procedures for nonmessage materials. We mentioned this in an earlier chapter; you will see it again. We highly recommend automating as many as possible of these nonmessage materials. Many should be straightforward, others completely impractical for the 1977 test. We consider the readboard nonmessage items to belong to the former category.

6. PROGRAMMABLE FILE FEATURES

This chapter covers an assortment of file features planned to provide the flexibility necessary to satisfy the divergent filing needs of various military agencies.

6.1 OVERVIEW OF FILE FEATURES PRESENTED TO THE SUBJECTS

We'd like to talk about the ways you can organize and control files. And then we'll talk about the explicit operations using the keyboard to get information in and out. Let's talk about the organization of a file first.

This (Fig. 6-1) is a file header that you could specify differently for each one of your files. It tells how the file is going to work. Here, we've given an example of a file called VISITORS. Now, this isn't necessarily something you would deal with, but it will give you an idea of how the filing system works. The first item is the name of the file. It is the VISITORS file.

The next area is for notes; you can type anything in here that you want about the file. This is equivalent to just writing something on the outside of your present manila file folder.

The next thing is the access privileges which indicate who has access to that file, other than you as the owner of the file, and any other privileges they may have. Now, the way this would work is that you would type in here a list of names or office codes, and for each office code in the list you could type a check mark in any of these columns indicating the privileges that they have with respect to this file. Hardcopy: to print out hardcopies of messages in the file. Annotate allows them to add notes or comments to individual entries. Append gives them the capability to add messages to a file. Delete allows them to delete messages from a file, and own is the individual who owns the file.

An important concept of this filing system is this input filter, and the way this would work is that every incoming message would automatically be checked against every one of your files. If the conditions of the input filter are matched in the message, the message will be copied to the file. Now, as an example, in this VISITORS file, any message that has in the subject field the word "visitors" or in the subject field the word "arrangements" would be copied into this file. This can work on any fields of the message. You might be interested in originator, flagwords, or subject. It can be specified differently for different files.

The fields for retrieval allows you to specify the fields in the message that you will later use to select messages from this file. And, as an example, we say that any message in this file can be retrieved by precedence field or originator field or the subject field. Again, you can select any of the fields of the message you want for this and it can be different for different files. It's up to you.

The display format allows you to specify how the excerpts or header information will look when you ask to display excerpts of the messages that are in a file. For this file, as an example, we have arranged it in terms of security classification, precedence, action,

date-time group, originator, and part of the subject string. Now the display format in the file header will allow you to specify, if you want to, different display formats for different files, and also you may specify them differently based on the sources of messages. Again, this is up to you and you could select some standard format if you want to.

We allow you to specify file storage time which indicates how long unreferenced messages will stay in this file before they are automatically backed up on magnetic tape. Again, this something that you could specify differently for each one of your files, if you wanted to.

The instructions allow you to specify some additional things that you want done to every message coming into a file. As an example, we've indicated that every message coming in would be hardcopied. In fact, you could have a list of instructions, for example, to forward messages to other individuals, or you could have nothing. It's up to you and it could be different for different files.

6.2 ACCESS PRIVILEGES

6.2.1 A Question on File Access Privileges

Now, we'd like for you to numerically rate these various features beginning with the access privileges.

6.2.2 Analysis of Responses to Access Privileges

Figure 6-2 shows their responses. *Twelve of 21 respondents who answered the question considered this feature essential.* There was no significant variation among subgroups.

6.2.3 Remarks on File Access Privileges

Respondent: We just want to make sure that people can get to our messages but not delete them.

Respondent: In a system like this, you have to have something to preclude everyone from getting access to things they have no need for.

Respondent: *I see that as having to be in some sort of tree structure* because, for instance, J31 should be able to get into the files of any branch in 31; 311, 312, 313. And I should think that would be implicit in the system. You absolutely have to.

VISITORS
NOTES

ACCESS PRIVILEGES
NAME/CODE   HARDCOPY   ANNOTATED   APPEND   DELETE   OWN

INPUT FILTER
SUBJECT: VISITORS OR SUBJECT: ARRANGEMENTS
FIELDS FOR RETRIEVAL
PRECEDENCE, ORIGINATOR, SUBJECT
DISPLAY FORMAT - Internal Messages received

DISPLAY FORMAT - AUTODIN messages received

DISPLAY FORMAT - Messages for review

DISPLAY FORMAT - Messages from review

FILE STORAGE TIME

INSTRUCTIONS

HARDCOPY

Fig. 6-1   Example File Header

```
code
     I
 -1. ****  (      1)
     I
     I
     I
  0. *********  (      3)
     I
     I
     I
  1. *******  (      2)
     I
     I
     I
  2. *********  (      3)
     I
     I
     I
  3. *************************************  (     12)
     I
     I
     I
     I
     I.........I........I.........I........I........I
     0        4        8        12       16       20
     frequency
```

MEAN   2.048   MODE   3.000   STD DEV   1.322

VALID CASES   21   MISSING CASES   1
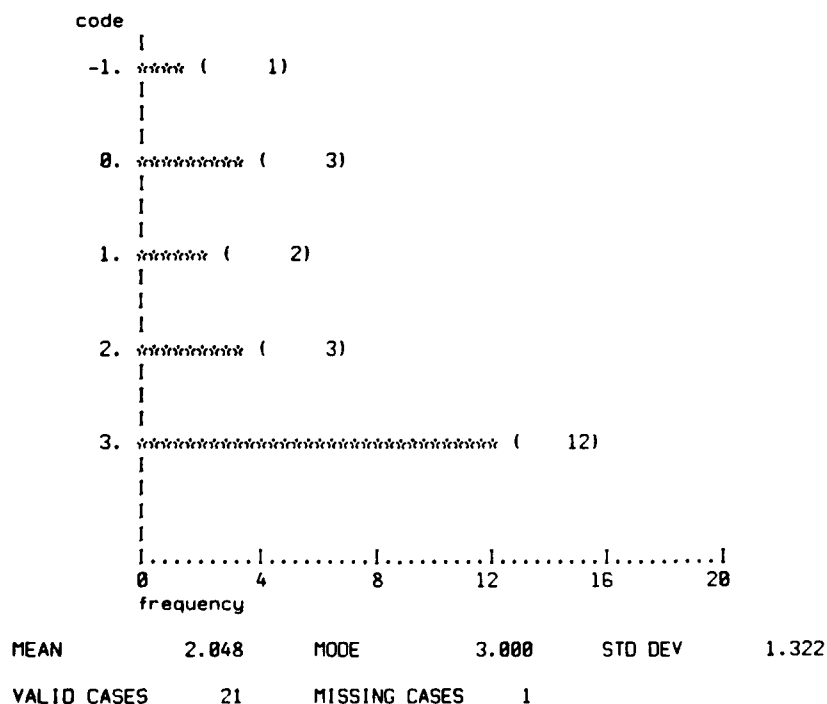
Fig. 6-2   Ratings for File Access Priviliges

Interviewer: If it is as simple as that, then we certainly don't need this mechanism -- if it really, in fact, is a tree structure.

Respondent: Well, there might be other people besides that. For example, I might want to have J6 access my file on communications.

Interviewer: There is no problem in the tree structure case of subordinate compromise, where you really don't want your boss to know what you are fiddling around with in your file right now?

Respondent: I don't think there should be. He is the boss, after all. He should be able to see what is going on. That's the way it is right now. He gets everything that comes to J--. That's as it should be.

Interviewer: Okay, so we should have the implicit tree structure or org chart, and in addition allow you to designate others who could access a file.

Respondent: You don't need names because people leave. Codes are fine. The DDO is like a code, it is necessary.

Respondent: Let me ask a question. This system is on GENSER traffic right now?

Interviewer: Yes. GENSER traffic to top secret.

Respondent: Is it ever going into SI?

Interviewer: This test system is not, to my knowledge. *But an operational system that might be built from the test would probably handle multilevel security in GENSER and SI.*

Respondent: *Okay. On that basis, I say yes. You need it because there are people who would not have the clearances to take a look at messages,* and we would have to be the arbitrators of that. So I agree with all of this.

Respondent: I suppose what it does is protect and give you some privacy over what you are building in your file. It depends on the range of users who might be able to access your file. If you assume a fairly small group of people who might be able to access your file, let's say any action officer within CINCPAC Headquarters, then I wouldn't worry that much about it.

Interviewer: Is that the range of people who have access to your files?

Respondent: Surely. If anyone comes in and asks me to see a message, I don't say "I can't show it to you, it is private." I consider anything I do

officially as open to anybody with official status. *But if you're considering the possibility of access from outside the Headquarters, beyond the component level ...*

Interviewer: Not in the 1977 test, but certainly in an operational system, there would be a saturation of terminals here on the Island and also at other locations.

Respondent: In that case I think that would be a plus three.

6.2.4 A Question on Changes to the Proposed Schema

What about these particular privileges we've indicated (Fig. 6-1)? We listed all we could think of, but, for example, if everyone who can read a file (that is, everyone whose name or code you put there) can also make printed copies, then there wouldn't be any point in our having that column and forcing you to make check marks there. We'd just leave it off. Likewise, for example, if no one except the owner could delete entries, then there wouldn't be any point in having it there because you'd never put a check mark there. So, if there are any columns where you would never put a check mark or you always would, then tell me and we can just omit those columns.

6.2.5 Analysis of Responses to Changing Privileges

As long as the test service is confined to GENSER traffic within the Headquarters, no one cared to restrict hardcopy separately from the read privilege. About half the subjects felt the same about annotation. All felt that delete should be closed to the ownership. Most felt that append should remain distinct as an optional privilege.

6.2.6 Remarks on Changes to the Proposed Schema

Respondent: You don't need hardcopy and annotate.

Respondent: *If you are looking at just GENSER traffic in this building, then I would say you could delete hardcopy* because anyone who we would open up on it, we would have no objections to them making a hardcopy.

Interviewer: With the GENSER traffic, would it also be okay for them to make remarks in the file, the annotation?

Respondent: It doesn't matter.

6.3 INPUT FILTER FOR FILING MESSAGES AUTOMATICALLY

6.3.1 The Question of Automatic Filing

What about the input filter -- the capability of being able to automatically trap copies of incoming messages and file them according to subject, SSIC code, or whatever you want? How would you rate that capability?

6.3.2 Analysis of Responses to Automatic Filing

Figure 6-3 (p. 47) illustrates the responses. *The subjects were fairly evenly divided between highly desirable and necessary.*

6.3.3 Remarks on Automatic Filing

Respondent: As long as it also goes into your PENDING file, this is excellent.

Respondent: That's a necessary requirement.

Respondent: Conceptually, it is a nice idea. *But I can't visualize defining constraints specifically enough to make it of any use.* For example, you list "visitors" here, and visitors is one of the things we try to keep track of. But visitors fall within so many categories with so many special exceptions, that I just can't see putting together a subject definition that would include all of the visitors we are interested in. I don't know how you could define it to suit our needs.

Interviewer: Within your 15 subject files, how do you classify a message now? What determines which file it goes in?

Respondent: The content of the message. The text.

Respondent: The right keywords will trap most of them.

Respondent: How do you know you aren't missing something?

Interviewer: A copy will always, automatically go in your PENDING file. You can display the excerpts of a subject file to see what's there.

Respondent: Okay.

Respondent: Based upon my experience to date, I am "anti". I know the system can be cleaned up. I would rate that a plus two.

Interviewer: The way LDMX works right now in looking at the message is very fixed for everyone. Here, we're trying to give the ability to specify the way it should look for you and what it should look for.

6.4 PRESPECIFICATION OF FIELDS FOR MESSAGE RETRIEVAL

6.4.1 A Retrieval Question

What about the specification of retrieval conditions? What rating would you give that?

6.4.2 Analysis of Responses to Prespecification of Retrieval Conditions

Overall, subjects rated this highly desirable, with a mean = 2.2, std. dev. = 0.9, and mode = 2. There was a significant difference between the responses of the enlisted personnel in administration and each other subgroup. The administration personnel considered the retrieval filter essential; see Fig. 6-4. Figure 6-5 shows the responses of all subjects except administration personnel. Considered independently, each of these other subgroups rated this feature highly desirable.

6.4.3 Remarks on Prespecification of Retrieval Conditions

Respondent: Plus three. That is half of our work, retrieving messages.

Respondent: I could foresee, especially during a crisis where the traffic does get very voluminous, that you would want to screen messages so that you look only at flash or immediate.

Interviewer: If you retrieved it by stating date-time group within a period of a month, that should certainly cut down on the number of message headers you'd have to scan to pick out the one you wanted.

Respondent: That's assuming that the subject you see in your mind is the same one that's listed in the computer for the message. I used the example of ammunition in Korea before. Suppose I want to go back and find out about ammunition storage in Korea, but the message may be listed under the topic of "Construction of Storage Sites." There might not be compatibility of terminology.

Interviewer: Let me suggest something else that might be more useful. Instead of using the subject, you could use keywords that you generate. If you are going to remember a message by ammunition, then enter it with that as a keyword.

Respondent: But the originator of the message in Korea doesn't have my flagword.

Interviewer: But we're talking about your personal filing system. You're the one recalling the message. Would you not remember that, when filing, you had made the association between that message and the word ammunition?

Respondent: It's difficult to say. You see a wide variety of messages dealing with a wide variety of subjects.

Respondent: You can spend hours just looking for one message now.

Respondent: *Probably the originator, subject, and time frame.* By that I mean we know the message came in in September of 1975.

Respondent: *Now, that means you can't make an ad hoc retrieval.* As you are going through or working on your files, you couldn't say I'd like to get it by subject or I'd like to get a message if it has the word ----- in it, or something like that.

Interviewer: Let's say, for example, that you had given just this: subject, originator, and precedence. Now, date-time group range is implied -- you can always retrieve on the basis of that. Later you want to retrieve this on the basis of SSIC code. You wouldn't be allowed to do that. And it may seem a little obscure to you, as to why that is true, but it has to do with a possible internal organization of a file. This organization would allow the implementers to save space by not maintaining any other attributes than the ones you list here. This retrieval filter, of course, is there to help the implementers, not you. You could omit the retrieval filter and retrieve on any field, but that would require more file storage and thus more dollars.

Respondent: Do you consider the body of the message a field?

Interviewer: It is a field in a sense. We don't envision the capability of searching for matches on words or phrases throughout the text. But if that is important to you, then say so and give it a rating and I'll report that to those people who are building the services. Would that be of value to you?

Respondent: Yes it is. I'd give that a plus one. For whatever reasons, good or bad, you might be looking in a hurry to find a message that had a

particular word or phrase in it. You know what that was but you couldn't remember exactly what message it appeared in.

6.5 THE FORMAT OF MESSAGE EXCERPTS

6.5.1 A Question on the Format of Message Excerpts

What about the display format of these message headers or excerpts? Again, you could have the capability of specifying the format and content of that header information. How would you rate the ability to be able to specify the way in which you want to see those headers? And would you do it differently for different files?

6.5.2 Analysis of Responses to the Format of Message Excerpts

Figure 6-6 gives the rather curious set of responses. Although the most common reply was "necessary requirement," (mode = 3) *the mean response was useful*, (mean = 1.7). The standard deviation is rather high, although there was no significant difference in responses among the subgroups.

Thirteen subjects answered the question of whether this setting should be a global parameter or whether it should be file-specific. Only four of 13 felt that they would apply the definition differently for different files, yet three of the four rated the ability to do so as essential.

6.5.3 Remarks on the Format of Message Excerpts

Respondent: Plus one. That's desirable. It's not mandatory. I could accept whatever is set up. Zero for different files. I would not do it differently. I want the subject line first.

Respondent: Minus three. I think it should go originator, date-time group, action/info., and precedence at the end. I think the system should provide one print out for the entire staff. There should not be that flexibility. It's an unneeded expense.

6.6 INSTRUCTIONS APPLIED TO EACH FILED MESSAGE

6.6.1 A Question on Programmed Instructions

Now, what about the programmed instructions? Every time a message goes into a file, either automatically or by explicit filing, you could have some other operations performed on that message, such as in this case hardcopying, or perhaps opening another office. How do you rate this?

6.6.2 Analysis of Responses to Programmed Instructions

Taken as a whole, we have a bimodal distribution of replies with mean = 1.7, std. dev. = 1.1, and mode = 2. Examined as subgroups, there are two significant differences. Enlisted men had a mean = 2.5 and std. dev. = 0.5, contrasted with officers whose mean = 1.2 and std. dev. = 1.1. The essence of this difference appears in a small subgroup of these divisions. That is, as shown in Fig. 6-7 and Fig. 6-8, *enlisted personnel who support action officers rated this highly desirable*, with very little intragroup variation (std. dev. = 0.5), while *action officers rated it useful*, but with much more variety of opinion within the group (std. dev. = 1.2).

6.6.3 Remarks on Programmed Instructions

Respondent: For example, every SPECAT is sent to the front office. I could send it automatically.

Respondent: It is highly desirable. It is useful to me because a lot of our work is routine. I could put in instructions to take care of it.

Respondent: I could do that without going to the computer. I could do that through the comm center.

Interviewer: That's true. And it would take you a lot longer. There is a lot more work involved in that.

Respondent: I think the hardcopy is going to be the working document. I can't see people going to the computer and calling up messages and reading them, and then calling up another one. What they are going to do is get hardcopy and carry it around, a wad in their hand, and page through it.

Interviewer: Perhaps some will and others won't. If the service provides useful functions, some people may choose to use them.

6.7 INTERPRETATIONS AND RECOMMENDATIONS

Regarding access privileges, we feel that the ability to assign read access to files is needed. Subjects were asked to comment on the procedure for doing so, implied by Fig. 6-1, that is, entering office codes in tabular form and checking boxes for additional privileges. No one objected to this form, nor suggested an alternative. We continue to generally recommend this tabular form for lists rather than using parameterized instructions. The office code entry implies the read privilege. For GENSER messages

```
code
 I
-1. ****** (     1)
 I
 I
 I
0. ************ (     2)
 I
 I
 I
1. ****** (     1)
 I
 I
2. **************************************** (     9)
 I
 I
3. ************************************** (     8)
 I
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   2.000   MODE   2.000   STD DEV   1.140

VALID CASES   21   MISSING CASES   1

Fig. 6-3 Ratings for Automatic Filing

```
code
 I
3. ****************** (     3)
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   3.000   MODE   3.000   STD DEV   0.000

VALID CASES   3   MISSING CASES   0

Fig. 6-4 Ratings for Message Retrieval Specification:
Enlisted Personnel in Administration

```
code
 I
0. ************* (     2)
 I
 I
2. **************************************************** (    10)
 I
 I
3. ******************************* (     5)
 I
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   2.059   MODE   2.000   STD DEV   0.899

VALID CASES   17   MISSING CASES   2

Fig. 6-5 Ratings for Message Retrieval Specifications:
Excluding Administration Personnel

```
code
 I
-3. ****** (     1)
 I
 I
0. ************ (     2)
 I
 I
1. **************************** (     5)
 I
 I
2. ************************************* (     6)
 I
 I
3. ********************************** (     7)
 I
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   1.667   MODE   3.000   STD DEV   1.461

VALID CASES   21   MISSING CASES   1

Fig. 6-6 Ratings for Format of Message Excerpts

```
code
 I
2. ************ (     2)
 I
 I
3. ****************** (     3)
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   2.600   MODE   3.000   STD DEV   0.548

VALID CASES   5   MISSING CASES   1

Fig. 6-7 Ratings for Programmed Instructions:
Enlisted Personnel, Action Officer Support

```
code
 I
0. ********************** (     4)
 I
 I
1. ************ (     2)
 I
 I
2. ********************** (     4)
 I
 I
3. ************ (     2)
 I
 I
 I.........I.........I.........I.........I.........I
 0         2         4         6         8        10
 frequency
```

MEAN   1.333   MODE   0.000   STD DEV   1.155

VALID CASES   12   MISSING CASES   0

Fig. 6-8 Ratings for Programmed Instructions: Action Officers

within CINCPAC, the read privilege should imply the hardcopy privilege. It is debatable as to whether read should imply annotate. The delete privilege probably should not appear in the matrix; it might inadvertently cause more harm than good. In general it is not needed. For example, in administration, those who would we feel that delete share a common office code, and we feel that delete should be based on office code, not personal name or password. In the command center, there could arise a need for those other than the owner of the file to delete, for example, DDO and J--. For this exception, one might use an explicit instruction form to assign the delete privilege, rather than the tabular list. Although no one suggested removing the append privilege from the matrix, neither did anyone offer an example of its use in their job function, with the exception of readboard construction.

As pointed out by italics in the dialogue, one respondent identified the need for implied hierarchical access based on organizational structure. Although the access requirement may exist, it can be easily assigned explicitly through the proposed scheme of typing in office codes. Therefore, we would class this proposed feature (that is, building it into the service) as a nicety rather than a necessity. If the designers plan to include it, they should also take into consideration the problem of changes in organizational structure, addressed in Chapter 14.

Regarding automatic filing, we concur with the subjects; it is highly desirable. But we would like to issue a warning. Most files are subject-oriented. If the service cannot decompose subject line and also isolate flagwords, then the utility of this feature will be extremely low. We believe this is a nontrivial task, since the designers have no control over the formatting and content of incoming messages; however, it is a worthwhile investment, time permitting.

In the opinions of the subjects, automated aids for retrieval are more useful than automatic filing. We agree. Incoming traffic can be filed explicitly from the PENDING file to appropriate subject files. These messages must be looked at anyway, for purposes of action assignment, etc. Retrieval exhibits the inverse problem. Instead of being handed a message to put away, one is asked to obtain one put away earlier. In filing, all the essentials are at hand; with retrieval there are unknowns. Consequently, a large portion of the subject's time is spent seeking messages -- especially those personnel in administration. Refer to Figs. 6-4 and 6-5. The retrieval process is most important and here the computer's characteristics of speed and symbol manipulation can be used advantageously. The most serviceable algorithm would be to allow users to retrieve based on the content of any message field, in the absence of any prespecification. If one were to seriously consider implementing this algorithm, there should be a very careful study of cost/benefit tradeoff in secondary storage requirements, access time, and CPU time. Thus, with our present imprecise information, we do not recommend this algorithm for the 1977 test. A feasible algorithm for the 1977 test is the one presented in this chapter. *As a minimum recommendation, we feel that it is essential that subjects be allowed to retrieve on originator, date-time range, flagwords, and user-assigned keywords. Users could retrieve from subject files, using these attributes, to satisfy almost all of their present needs.* Note, again, the requirement to parse the message to the extent of recognizing flagwords. If this cannot be done, then users would have to add them as keywords upon filing.

The specification of format and content of message excerpts was rated as useful, although the distribution of responses is rather peculiar. When asked exactly what they

would like to see, most subjects gave essentially the same answer. Although we are about to make an independent recommendation here, the designers should consider this feature along with programmed notices (Chapter 10), since the same programming applies to both. *The respondents want to see the originator, some part of the subject, action/info, precedence, and DTG, in more or less that order. As a minimum facility, we recommend this fixed information without the ability for the user to program it.* Incidentally, we feel that the DTG is not needed. Their constant request for it is based on present manual practices. With the proposed filing system, there simply isn't a need to remember or type in a string of digits, beyond stating a DTG range (such as SEPTEMBER) for retrieval requests.

The stored program which is executed with respect to each filed message received a rating of useful. Clerical personnel believed this would reduce their work load, and so rated it highly desirable. No one suggested any operations other than hardcopy and open. We did not present the concept of programming with conditionals because we did not believe this was feasible to implement within the time constraints of the test. *Given the ease with which one can hardcopy or open either an entire file or a selected subset (see Chapter 7) we classify the stored program as a nice but nonrequired feature.*

7. THE GENERAL FORM OF INSTRUCTIONS

An earlier study [Heafner 76] investigated several different man/computer language forms for military use. It also examined input devices, namely light pen and keyboard/function keys. Based on that study and other constraints, it was our opinion that a (mainly) positional language using keyboard/function keys would be appropriate for the 1977 test. The intent of this chapter (and one question in Chapter 13) is to verify that the proposed communication form is suitable, and to check syntax and vocabulary. To do this, we presented example instructions and asked the subjects for their opinions. We then inquired about the desired use of Boolean expressions as a selection mechanism to isolate the access to specific messages.

7.1 THE PROPOSED LANGUAGE FORM

7.1.1 Overview of the Language Form Presented to the Subjects

Now let's talk about some of the ways that we can access this information in the files. We have some examples of how you would go about instructing the system to carry out some of these tasks. In particular, some of the ones we've illustrated here (Fig. 7-1) are retrieval and file storage operations. Each line represents one instruction that you would give to the computer. The labels in the boxes represent function keys on the keyboard and all you would have to do is press that key. These would be fairly common and important functions.

For example, again using the VISITORS file, suppose you want to see all the messages in that file that were drafted by J33. Push the DISPLAY key, type the name of the file, push the DRAFTER key, type J33, push the EXECUTE key, then you'll get a listing on your screen like this (Fig. 7-2) of all the messages from that file that were drafted by J33. As another example, suppose you want all the ones in the VISITORS file whose subject is Congressman somebody. Push DISPLAY, type VISITORS, push the SUBJECT key, type CONGRESSMAN SMITH, and EXECUTE, and you get those messages from the VISITORS file whose subject contains Congressman Smith.

To delete messages from the file, push the DELETE key, type the name of the file, DRAFTER J33, EXECUTE; it would delete those messages from the VISITORS file that were drafted by J33. Same thing for hardcopy.

To file a message, suppose you're looking at one individual message on your screen like this (Fig. 1-3b) and you want to file this message. In addition to those other retrieval fields that you would specify when setting up the VISITORS file, you also will be interested in the drafter field. You could push the FILE key, type the name of the file that you want to put the message in, push the DRAFTER key, and EXECUTE. If you're simply filing this in the VISITORS file and want to file it the way all of the other messages are filed, you wouldn't need this key. Push FILE, type VISITORS, EXECUTE and that's it, the message is filed.

Again, going back here (Fig. 7-2) if you have a display of excerpts, and you want to see message number two, push DISPLAY, type 2, EXECUTE and you get message number

2. *If you have a list of message excerpts, again, and you want to forward some of them to other individuals, open them on the messages, then push the FORWARD key, type the message numbers that you want, the office code where they are going J311, EXECUTE, and the J311 code would be added to their distribution list and they would be sent to J311 and automatically added to his PENDING file.*

7.1.2 A Question on the Proposed Language Form

Don't be concerned with the specific examples, but rather the general way we envision you would go about it, having keys for the important fixed functions and then typing in the information that is variable. I'd like to get your comments on the general form of this kind of interaction with the computer, and also get your comments on the vocabulary words we have been using.

7.1.3 Analysis of Responses to the Proposed Language Form

There were few objections to the syntax. From the example keyboard (Fig. 1-1), which was completed only to the extent necessary to illustrate the example instructions, several recommendations were made with respect to vocabulary and with respect to which arguments should be function keys. *Almost everyone suggested OPEN to replace FORWARD. A few people suggested slant signs to replace commas. ORIGINATOR and DTC were recommended as function buttons, and DRAFTER should be removed.* We give an expanded recommendation at the end of the chapter.

7.1.4 Remarks on the Proposed Language Form

Respondent: It's understandable.

Respondent: I would have a button for originator, but not drafter.

Respondent: They are reasonable words, I have no quarrel with them.

Respondent: The vocabulary is fine.

Respondent: Are we going to deal with the keyboard specifically later?

Interviewer: Are you familiar with light pens or other pointing devices?

Respondent: Yes.

Interviewer: I have a question later regarding your preference of pointing devices versus function keys.

Respondent: The thing I'm talking about is the EXECUTE button. On the existing equipment it is down here in the corner. On this one (Fig. 1-1) it is up here. *I would see some advantage in trying to arrange it so it is somewhere near or similar to the keyboards we have now.*

Interviewer: Presumably, between the test next year and the development of an operational system, there will be some human factors design of the terminal carried out. There hasn't been, to my knowledge, for this test next year. The keyboard that you see here (Fig. 1-1) was chosen, I believe, from the standpoint of reliability and it has these keys up here in the same proximity as this figure. We could put any labels on them for any functions.

Respondent: I certainly think that they ought to do that before a real operational system. Because we're going to have several different keyboards and it is just going to be a source of error ... Use open instead of forward ... You have these separated by commas; the existing system separates them by slant signs. In the changeover that might be a source of error. You might want to consider making that a slant sign. It seems arbitrary to me anyway. Everyone uses slant signs in LDMX and a lot of people here and in Washington and other places are familiar with that.

Respondent: Forward -- I would use open for this staff.

Respondent: I understand the idea, and the words are fine with me.

Respondent: You don't recall or pull something out by who drafted it. Now originator is something else again. As a suggestion, originator might replace drafter as a button. I'd say open instead of forward.

Respondent: I think the function buttons are mandatory rather than having to hunt and peck. I think this is okay.

Respondent: Fine. Open up would probably be a more standard form than forward.

Respondent: I don't seem to have any problem with the words that you've

used. *And I like the minimum amount of typing that you've built into the system.* I don't see any problem at all. It's much simpler than I would have expected ... Forward is not a very descriptive word in the jargon of the Headquarters. If you told me that's what it meant then I suppose I could get used to that.

Interviewer: I don't want to do that. I want to use the words that you're using now.

Respondent: The term used in the Headquarters is open.

Respondent: It makes it look very easy.

Interviewer: That's the intent. Is it a reasonable way to operate?

Respondent: Sure looks it. I don't want a drafter key, I want originator, I want date-time group. I would say date-time group would be most valuable.

7.2 MESSAGE ACCESS BY TWO LOGICAL CONDITIONS

7.2.1 A Question on Two-Condition Access

Let's talk about some other kinds of instructions that will allow you to select more carefully or more finely the subset of messages that you want from a file, assuming that you really don't want to see them all. As an example (Fig. 7-3), in the VISITORS file, suppose you want to see all the messages that were drafted by J32 and also had a date-time group in the month of May (and since you specified that you'd like a DTG key, we can assume that this is actually a key). The way it would work is that you'd press HARDCOPY, type the name of the file, VISITORS, press DRAFTER, type J32, type the word AND, push the DTG key, and enter, in this case, a range for date-time group. The service knows about different ways of specifying dates and also real date-time groups. Now, push EXECUTE. And what you would get is just those message headers from the VISITORS file corresponding to messages that were drafted by J32 during May. As another example, suppose you're interested in two blocks of messages, again from the VISITORS file, but ones released by J3 or released by J3A. You do it this way. DISPLAY, name of the file, RELEASER J3, type OR, press RELEASER, type J3A, EXECUTE. And you get two blocks of message headers from the VISITORS file: the ones released by J3 and the ones released by J3A.

We'd like for you to rate numerically the ability to couple together two of these selection conditions in order to extract more precisely the information you want.

7.2.2 Analysis of Responses to Two-condition Access

| DISPLAY | VISITORS | DRAFTER | J33 | EXECUTE |

| DELETE | VISITORS | DRAFTER | J33 | EXECUTE |

| HARDCOPY | VISITORS | DRAFTER | J33 | EXECUTE |

| FILE | VISITORS | DRAFTER | | EXECUTE |

| DISPLAY | 2 | EXECUTE |

| FORWARD | 1,6 | J3II | EXECUTE |

Fig. 7-1   Example Instructions

File: VISITORS

1. Secret Immediate Action 200146Z July 76 NAVSEEACT Korean Operations

2. Unclass. Routine Info. 192723Z July 76 CINCPACFLT Korean Operations

Fig. 7-2   Excerpts from VISITORS File,
drafted by J33

| HARDCOPY | VISITORS | DRAFTER | J32 AND DTG:5/1/76-5/31/76 | EXECUTE |

| DISPLAY | VISITORS | RELEASER | J3 OR | RELEASER | J3A | EXECUTE |

Fig. 7-3   Example Instructions

Figure 7-4 shows the responses which were rated as highly desirable. This was the uniform opinion of all subgroups.

MEAN	2.095	MODE	2.000	STD DEV	0.889
VALID CASES	21	MISSING CASES	1		
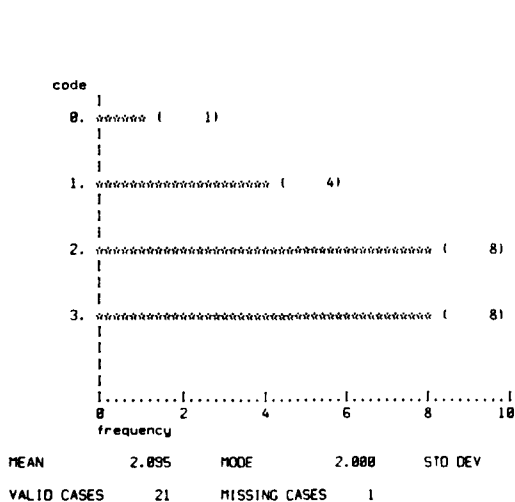
Fig. 7-4 Ratings for Two-Condition Access

MEAN	1.750	MODE	3.000	STD DEV	1.372
VALID CASES	20	MISSING CASES	2		
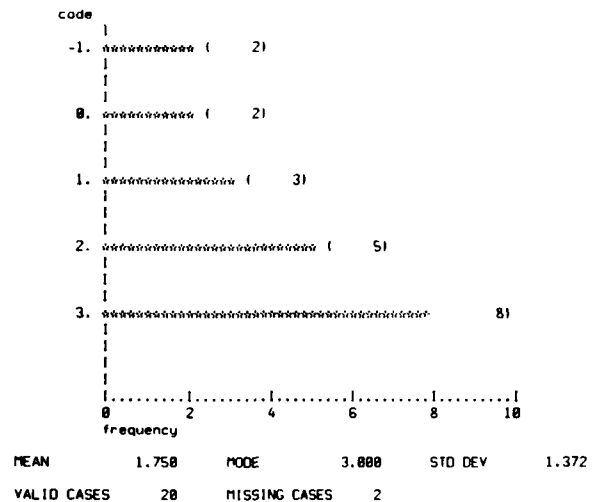
Fig. 7-5 Ratings for Boolean Expressions

7.2.3 Remarks on Two-Condition Access

Respondent: Quite often I get requests from someone who has lost their comeback copy and they want a message they originated last week sometime. And we go through the file message-by-message.

Interviewer: How would you ask for that?

Respondent: I would ask for messages released by such and such an office or originator, say, from the 1st to the 7th of July. Sometimes people give us keywords from the subject.

Respondent: It might be nice to have some default options here -- the date could default to 1 if you don't specify. I wrote down here descriptors. I'm not a data processing guy but I have used library systems. It is a little bit similar. What happens here is that a message is looked at and receives several descriptors: three, four, five, numbers or whatever. This is useful when you want to go back and access something and you don't know exactly what it is you want. And it is a little bit different from using words because words tend to be a little too specific. Is this going to be a capability that we have?

Interviewer: What kinds of descriptors do you have in mind?

Respondent: Oh, just numbers. I would say things that deal with aircraft, reconnaissance.

Interviewer: One of the things we were thinking of is to allow you to add keywords like the flagwords on a message, so that you could retrieve on the basis of the keywords. That's what you're asking for I think. Is that sufficient or would you like to have something like attribute/value pairs such as LOCATION: HONOLULU, LOCATION: NAPLES and then be able to retrieve everything from a given location?

Respondent: I would like to see something that forces you to put appropriate descriptors on ...

Interviewer: Well, "appropriate" is very subjective.

Respondent: Yes. The SSICs are not useful.

Interviewer: You have the problem of having either too many or too few. So you have to be judicious in your choice for descriptors for your own use. We can provide the facility for you to use keywords.

Respondent: All right. That could be added then, and later used as a basis of retrieval.

Interviewer: Yes.

Respondent: That's fine. I think you really have to have that.

Respondent: Retrieval is the big thing. This will save us time.

Respondent: I really like that. I have one file right now that contains 750 messages. Is it amenable to this system?

Interviewer: Yes. And in a moment we will discuss perhaps a more appropriate access method for that file, to extract a single message.

Respondent: I also like the ability to stipulate a time period for a message.

7.2.4 A Question on the use of AND and OR

What about the use of the words "and" and "or?" Would you prefer some other punctuation?

7.2.5 Analysis of Responses to the use of AND and OR

Only two subjects suggested alternate connectives, which were comma and slant sign. The remainder preferred AND and OR, and they preferred to type them rather than use a valuable function key for that purpose.

7.3 CHAINING LOGICAL EXPRESSIONS FOR MESSAGE ACCESS

7.3.1 A Question on Boolean Expressions

There is yet another way to more precisely select the information you want. The idea is to be able to string or chain these conditions together in even more precise kinds of search requests. Again, using the example of the VISITORS file, suppose you want all the message headers that were drafted by J32 with a date-time group of May, and with the subject of Congressman Smith or Congressman Jones. Press DISPLAY, type the file name, press DRAFTER, enter J32, the DTG of May, press SUBJECT, type CONGRESSMAN SMITH, type OR, press SUBJECT, and type CONGRESSMAN JONES, then EXECUTE. You would get just those message headers released in May, drafted by J32, and dealing with either Congressman Smith or Congressman Jones. The concept here is the ability to chain these selection conditions together in the precise way you want in order to pick out just the one message or the set of messages that you're interested in.

How would you rate the capability of chaining search requests in this way?

7.3.2 Analysis of Responses to Boolean Expressions

Figure 7-5 shows responses to the question on Boolean requests. *It was rated desirable. Although the mean = 1.8 is slightly less than that of the previous question mean = 2.1, in each case more than a third of the respondents rated these features a requirement.* Their differences in responses are directly related to their file sizes. As might be expected, there was a significant positive correlation between their ratings on these two questions. There were no significant differences among subgroups.

7.3.3 Remarks on Boolean Expressions

Respondent: Now that would be very desirable. It's not a necessary requirement but it is very desirable. We can't do that now, by subject. If we don't have a date-time group or a control number, we're in trouble.

Interviewer: We're trying to get away from the numbers because something like a subject string makes more sense to people than a string of digits. In the service we've outlined, you can reference messages without ever having to enter a specific DTG.

Respondent: In fact, we had that problem last week. There were two

messages the General wanted to see and we had no idea what the date-time groups were.

Interviewer: Presumbly with the personal files organized the way you want them and the reference mechanism we've talked about, you wouldn't ever have to worry about a date-time group.

Respondent: *I want the facility to input a string of values separated by commas, where they have the same attribute, for example, RELEASER J1,J2.*

Respondent: That's fine. That's the basic Boolean problem.

Respondent: That gets right down to the very message you want. I can see that would be very useful.

Respondent: That gets a broad field down to something really narrow. I'd say a plus three because I know some "witch hunts" I've gone through trying to find a message on a subject.

Respondent: I think that would be a plus three, especially with large files. Our Thailand file is four manila folders. If you just give a date-time group in a certain area you'd get thousands of messages. I think it is very important to get down to the very specifics.

Interviewer: Do you think that you could easily identify the message you wanted using this feature?

Respondent: Yes. In that particular example, if you had Thailand, J--, DTG area, and flagwords such as air movements, just that, for example, would knock it down considerably.

7.4 UNSOLICITED REMARKS ON LANGUAGE FORM

Respondent: *Let's talk about language -- the language of your system. It should be the plainest, simplest, honest English.*

Interviewer: We showed you some examples earlier.

Respondent: Yes. You have achieved that in many respects. If you retain

that same capability, and not let the programmers start telling us we've got to put one X instead of FILE. FILE you understand, one X you don't, and to the users it's the most horrible part of an automated system.

Interviewer: I understand. When we talked with military people in Washington, we spent most of our time talking about the vocabulary and syntax of commands.

Respondent: You're never going to get all the action people so versed in a computer vocabulary that they can interact with it. There is constant change over; you cannot train the entire military to "one X." It just can't be done. The word FILE should mean file and it should be in plain English. Had we done this years ago in planning, in programming computers, we'd be far ahead.

Interviewer: Our problem is that we don't know what you want. We make our best guess and then come and talk with you about it, but it needs iteration.

Respondent: Our problem is that they'll come to me and say "What do you want" and I'll tell them and then they'll say "I can't give you that." So why are you asking me if you can't give it to me? "We can only give it to you in this type of vocabulary. Hit the caret or this inverted Y and it will do this." They are very interested in finding out what you want so that they can tell you that they can't give it to you.

Interviewer: I'm not directly associated with any of the three current candidate systems, but my understanding is that each of them can provide the kind of syntax and vocabulary that you want. And that's why we're here, to get your recommendations to give to them.

Respondent: I just want to emphasize, plain, simple English. NO or YES, EXECUTE, RETURN, GIVE IT BACK, things that even the "Kentucky plowboy" can read and understand. Then we're not going to "screw it up."

Interviewer: How about abbreviations?

Respondent: *Be very careful because abbreviations can get you in deep trouble in the joint arena, because each of the services has their own abbreviations, and they mean different things.*

Interviewer: We discovered that in Washington, they have the WASH-MIC [WASH-MIC 71], this big thick book of military acronyms, but it is inconsistent with their use of abbreviations and acroynms. The book is not up to date.

Respondent: It is an extremely beautiful way to get into trouble.

Interviewer: Let me suggest something and see how you react to it. You could indeed use abbreviations and acronyms on input. Where we echo or reflect what you are typing in, we would spell it out. That is, the output from the service would never be abbreviated. You could save yourself the typing on input. You get the positive feedback to see that it is in fact interpreted exactly as you intended. Would that be a decent way to do it?

Respondent: Oh, sure. There has to be some standard abbreviations and acronyms. The word CHOP is generally found in the joint arena or in the Navy. The Army doesn't know what a chop is, except what you do to meat. Usually, in the Army, it's concurrence or nonconcurrence.

So, you get a guy working in the Army arena and he uses the abbreviation OPS, which is operations. And you get a guy from the Navy using the same thing and it has a different meaning. And it just doesn't match. Every action officer who gets into the joint arena finds himself in deep trouble in 10 days. And he learns, and he never again uses any abbreviations that can possibly, under any circumstances, be misconstrued.

Interviewer: That's probably most all of them.

Respondent: That's nearly all of them. U.S., when it's in capital letters can rarely be misconstrued.

Interviewer: Right now you have a lot of abbreviations, like the security redundancy code. You'll enter 0000 for immediate. Would you expect to spell out immediate?

Respondent: You're talking about messages, which of course have to have brevity. I'm speaking of primary memorandums, letters, and things like this. Messages have to have this.

Interviewer: So, we should stick with the standard abbreviations for message processing?

Respondent: I guess you can't do away with those. In the text is where the confusion is liable to arise.

Interviewer: The text is not interpreted by the service.

Respondent: I was just reacting rather vividly to a question on the use of abbreviations ... *I wrote a message to JCS, I retrieve it from the archives or my files. Now I want that message hardcopied. All I need to do is hit the HARDCOPY.*

Interviewer: Everyone we've talked with wants contextual defaults where you don't have to give the identification because it is obvious that it's the message you're looking at.

Respondent: *That's right. The same with the alert. If I say HARDCOPY, I mean the one I'm alerted to,* because I don't want it printed out on my reader, I may have other things I'm looking at.

7.5 INTERPRETATIONS AND RECOMMENDATIONS

We recommend providing Boolean expressions for message selection. It was highly rated by those subjects, relative to their rating of other features. Message retrieval is

one of their biggest problems, and in this way an automated service can greatly help. The grouping or nesting problem was not discussed, nor was NOT. We felt that with the limited time we were allotted with each person, the time could be better spent discussing other parts of the service. We believe that these people would have no trouble understanding a Venn diagram and accepting the use of parentheses, where needed.

As a very minimum capability, we recommend a two-condition selec:or which allows the user to choose from the following message fields: date-time range, originator, flagwords, and keywords.

The right syntax and vocabulary are crucial to the military's adoption of the service. We included some remarks on this by one respondent. He was not alone in this attitude. The form proposed resulted from the earlier study in Washington and was well received on Oahu, with few exceptions in form (see the chop list organization in Chapter 11). Vocabulary differs somewhat from that used in Washington, so below we have given their suggestions for function button labels. These functions are explained throughout the report.

Suggested labels for function buttons:

DISPLAY
FILE
HARDCOPY
REFERENCES
DRAFT
OPEN
SEND FOR CHOP
CHOP
RETURN TO DRAFTER
REASSIGN ACTION
ORIGINATOR
DTG
NEXT MESSAGE
PREVIOUS MESSAGE
SAVE MESSAGE AND INTERRUPT
RETURN TO PREVIOUS MESSAGE

8. FILE ARCHIVAL PRINCIPLES AND PRACTICES

Archiving messages serves two purposes in the proposed service. From the user's viewpoint, in order to be serviceable, file sizes must be kept within manageable limits. From the design and cost points of view, archiving reduces the amount of disk storage required. We began by posing two questions concerning both automatic and user-initiated archiving. The attempt was to get an idea of the amount of on-line storage required and determine how it might differ from the sizes of present hardcopy files. We were also concerned with retrieval time requirements. The subjects soon added two more questions to our list involving the exemption of messages from archive (similar to DON'T ARCHIVE in TENEX [Myer 73]), and precedence requests. Let's take a look.

8.1 AUTOMATIC ARCHIVAL

8.1.1 A Question on Automatic Archival

We mentioned something about file archiving and you had some questions about it earlier. There are really two reasons. From your point of view you want to reduce the clutter in your files. From our point of view we want to back things up on magnetic tape (which is what the archive will consist of) because it's much much cheaper than the on-line storage. The access time from your point of view is that if it's on-line you can access a message or an excerpt of a message in a couple of seconds and if it is on magnetic tape it may take several minutes up to perhaps a half an hour, depending on the number of concurrent requests from archives. So, in order to minimize the amount of on-line storage and therefore the cost, one feature that we could provide is the following: You recall here (Fig. 6-1) we have a file storage time block on the file header to indicate the time period, such as 30 days. So every 30 days for that file, the system would come along and look at all of the messages in that file, and all of those that had not been accessed by you or by someone else in that time period would be automatically archived on your personal archive file associated with that file. Then, the copies would be deleted from your on-line file, automatically. How would you rate that feature?

8.1.2 Analysis of Responses to Automatic Archival

Figure 8-1 illustrates the responses. *It was rated highly desirable, with the most common response being a requirement.* There was no significant differences among the subgroups, but there was a strong correlation between their responses here and their ratings of the general file system organization.

```
 . code
         I
     1.  ************** (     5)
         I
         I
         I
     2.  ****** (     2)
         I
         I
         I
     3.  ******************************************* (    14)
         I
         I
         I
         I
         I.........I.........I.........I.........I.........I
         0         4         8        12        16        20
         frequency

     MEAN        2.429      MODE       3.000     STD DEV      0.870

     VALID CASES    21      MISSING CASES    1
```
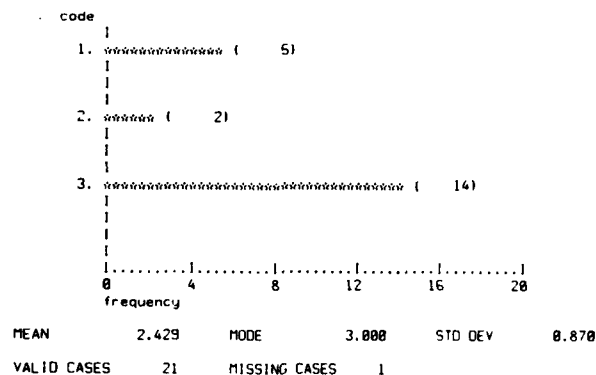
Fig. 8-1 Ratings for Automatic Archival

8.1.3 Remarks on Automatic Archival

Respondent: Plus three. It's something that has to be done. *We have been holding 30 days. With the time it would take you to retrieve it from the archive, probably 15 days would be fine.*

Respondent: How will I know, when I want to call for a message, whether it is on disk or tape?

Interviewer: You could have special independent archives associated with each of your personal files. You could display excerpts of your PENDING ARCHIVE file, for example, instead of your PENDING file. When you ask for an archived message, using the same instruction form you use for a message in your active files, the service will give you an estimate of how long the retrieval will take. The amount of time it takes depends upon the number of concurrent requests, but it shouldn't ever take more than an hour.

Respondent: The 30 days is longer than I need. I could get by with about 15 days.

Respondent: *What about TDY or leave? How do you get back the ones you haven't seen?*

Interviewer: A copy of all your incoming traffic will go in your PENDING file. Those messages that have arrived since you last displayed the file will be flagged in some way so that you'll know they are new. And if you haven't ever accessed a message, it won't be archived. So, all you have to do is display your PENDING file.

Respondent: *I would give it a sequence date. This business of looking at it or not looking at it doesn't really jell that well,* because you may look at something three or four times and then never need it. Or you may not look at another message and then need it on the 31st day.

Interviewer: Should it prompt you and say "I'm about to archive these messages, is it okay?"

Respondent: I shouldn't think so. As long as you are aware that every 60 days this particular file is going to be cleaned out.

Respondent: The longest I ever keep any message is a month. And basically, I keep a message one day. My desk is real-time; we are not a storage facility.

Respondent: No, that's too often.

interviewer: What time would you choose?

Respondent: I'd say once a year. Because that's why you put messages in files, to be able to find them when you need them. The business we're in, frequently, messages will be needed that are 5, 6 months, a year, or two years old. And the great utility of the files is to be able to go back and get that piece of paper. I think you really have to have that -- still put together under a particular subject as opposed to having to go back and get it off the LDMX archives.

Interviewer: When you go back and get something that is 6 months old, a year old, what are the time constraints in retrieving the message? Do you really need it in seconds versus minutes?

Respondent: Oh yes.

Interviewer: Fifteen minutes would not be adequate?

Respondent: No. That's not responsive.

Respondent: Some files could be archived after 10 days, others would be needed for a month or longer.

Respondent: Right now we have hardcopy messages in our files that are years and years old. But they give a chronology. We need that. So we have

determined that this overall file will be maintained. Every time you pull out the drawer, it's there to remind you. When you run out of drawer space, you do away with the lesser important files. You don't have, the way I visualize it, a purge system such as this, in this system. You, unknowingly, are going to create more and more reels of tape.

Interviewer: You can purge from your archive files and from your active files.

Respondent: What's the impetus to do this?

Interviewer: To purge something from your on-line files, you want to reduce the clutter. For archived files, there is less impetus. I don't know how you might promote that. It's a good idea. Perhaps some policy.

Respondent: *Perhaps every two or three years when you are leaving. Because the guy coming in, in all probability, doesn't have the knowledge to do that. He will start his own archive files and leave the old one going.*

Respondent: I think an arbitrary time period would be good. If you were to leave it to the individual action officer to clean out his files, I think you might have some problems. *Of course, when we talk about files, I keep thinking of perhaps thick files I have, maybe a small portion of which are messages, and this keeps bothering me because a good portion of mine are memos both for record and not for record.*

8.2 RETRIEVAL BASED ON PRECEDENCE OF THE REQUEST

The order of retrieval from archive, based upon the priority of the request, was not included as a question. However, after several requests for this feature, the remainder of the subjects were asked to comment on the ability of making priority requests. *It was rated highly desirable.*

8.2.1 Remarks on Priority Requests

Respondent: If there are lots of people on-line that are requesting information from the archives, is there any way to have a priority execute button or immediate button to retrieve? *Say, the General has to have a copy of this right now, he is talking to Washington on the phone, but it is in the archives. Do we have to make him wait an hour and hold that question?*

Interviewer: You should not have to. No one else has brought that up, but I guess you could use the same four levels you assign to messages, and enter a Z, O, P, or R along with the request. That's one of those things that could be abused, of course.

Respondent: Oh yes.

Interviewer: It becomes an administrative question. We can recommend the incorporation of that feature, but then you have the administration problem of seeing that it is not abused.

Respondent: You have a certain code that the machine knows. The machine could only accept certain precedence requests from certain codes.

Interviewer: Yes. How would you rate this feature that you've just described?

Respondent: Plus three.

Respondent: That would probably be the best way -- based on precedence, if stiff requirements were levied on the use of the priority system.

Respondent: Yes, I would like that function.

Respondent: Yes, definitely.

Respondent: Most of the time we have some forewarning. But sometimes we get, "Hey, remember that message. The CINC wants an answer now." So, we have to have an answer in half an hour. Well, if I have to wait an hour to get the message then I'm shot already.

8.3 EXEMPTING MESSAGES FROM ARCHIVE

No question was planned for the subjects regarding the exempting of messages from deletion from active files. However, after several requests for this feature, the remaining subjects were asked to rate the utility of being able to mark individual messages to remain in active files.

8.3.1 Analysis of Responses to Message Exempting

Seven subjects rated the feature desirable. Their mean = 1.9, std. dev. = 0.9, and mode = 1.

8.3.2 Remarks on Maintaining Messages indefinitely on Active Files

Respondent: Well, if it would be possible to identify a certain message as

some historical message, and tag it in some way so that you could save it, then you could have the system comb through there and clean up all the others and toss them out.

Respondent: From the point of view of its utility to me, in keeping my files cleared out? I was wondering if it might not be easier and just as acceptable to put an automatic, say 30 days, limit on all messages, and have them automatically put into the archive unless the user specified through some code to save them for an indefinite period, in which case they would not be archived until the user released them.

8.4 EXPLICIT ARCHIVAL

8.4.1 A Question on Explicit User-Instructed Archiving

Another feature is that you can explicitly file them away yourself in the archives, and you might do that on the basis of an entire file or specific entries in a file. How would you tend to do this?

8.4.2 Analysis of Responses on Explicit Archiving

Nineteen subjects responded. Eight would prefer to archive individual entries, three would archive entire files, and 8 want both options. Enlisted personnel in administration differed significantly from the remaining subgroups in that they would only archive file entries.

8.4.3 Remarks on Explicit Archiving

Respondent: I would say the whole file. I would also want to be able to clean up my archive file, say, every six months.

Respondent: We would archive by time period if it is something that is a day-to-day activity, to clean it out, just as we do in some of our ongoing files. You should also have the ability to archive the whole file -- the typhoon is over. I suppose that if you initially thought that a problem was going to be short-termed, and it turned out to be long-termed, then you would want the ability to archive certain messages from the file.

Respondent: I'd have to go both ways. For example, with aircraft movements,

once the event is over we throw away the messages. We may get notice that a Marine attack squadron is going to move back to El Toro, California. We get messages 15 or 20 days ahead of time. We hold them. As soon as those aircraft move 15 or 20 days later, we'll watch the traffic and see that the squadron is back on the West Coast, then I'll throw them away.

Interviewer: Would it be useful to do the following? In the file header we allowed you to specify the archival period. Another way we could do that is to allow you to tag specific messages with an archive or delete time. For example, if a squadron is moving to El Toro in 20 days, and you know you want to keep those messages for 20 days and then throw them away, then you could tag those messages in the file and say archive or delete after 20 or 30 days. That is, you could tag it at the time you were thinking about it rather that having to come back 3 weeks later to clean it up.

Respondent: I don't want to do that because they'll say "we're going to delay this move for 11 days but everything else pertains, route of flight, etc." I've entered a date that says get rid of this message 20 May because they're going to move on the 19th. And now they have delayed for 11 days. Now, the General comes in and asks if they are going to stop in Hawaii for fuel or refuel at Midway Island. And the message is gone.

8.5 INTERPRETATIONS AND RECOMMENDATIONS

Many of the archival features will depend upon the amount of disk storage available for the 1977 test, and the responsiveness of the service in retrieving from tape. Message traffic and other variables can probably be estimated fairly accurately. Longevity of messages on active files depends upon retrieval responsiveness, as was indicated by perhaps half a dozen respondents who thought they could, with this service, reduce their present active file sizes. In our estimation, there will have to be *ad hoc* policy established to govern on-line storage time for messages, and precedence retrieval requests. So, what can we recommend that will be useful to the designers? *We recommend the following capabilities. Their use should be governed by J3 policy. Provide the time slot in the file header for the user to specify minimal archival period. If users are not to maintain parallel hardcopy files, then precedence retrieval, we feel, is necessary. Tagging messages to exempt is necessary for some users when the alternatives are considered (i.e., hardcopy files or on-line files with extremely long archival periods). We would not recommend tagging on a file basis. Explicit archival (of at least messages) is recommended; it will help the user and conserve space.*

Recording read/write dates would seem a good idea. Recall that one respondent raised the question of losing (archiving) newly arrived messages while on leave.

9. ANNOTATION CAPABILITIES AND CONTROLS

Most everyone makes notes. Communication is the very essence of the planned service. So, many questions were included to determine where and when annotation capabilities would be most useful. Sometimes one enters reminders to himself, sometimes questions for others. Thus, we must also address the question of access to comments. Let us proceed.

9.1 THE POINT PAPER

9.1.1 A Question on On-Line Point Papers

We have a number of forms of comments that one can make and I'd like to get your numerical rating on which would be useful and which wouldn't. The first is a point paper. In drafting a message, if it's a long message, you may prepare a point paper, and right now that's a hardcopy that travels around with the draft. We can allow you to enter that on-line and send it around coupled to the message in the draft review process. How would you rate that?

9.1.2 Analysis of Responses to the Point Paper

The most appropriate figure (Fig. 9-1) to illustrate point paper responses is the diagram showing all except enlisted personnel in administration. *Figure 9-1 indicates that the on-line point paper is highly desirable.* Considering all subgroups, it was still highly desirable (mean = 2.4). The enlisted administration personnel also rated in highly desirable (mean = 2.0) but they were excluded from Fig. 9-1 (p. 75) because of the lack of messages originated by them.

9.1.3 Remarks on the Point Paper

Respondent: That's absolutely necessary to me. Many, many times I'm writing a message that is very short and cryptic, yet carries an immense amount of background. A guy for chop or release has to have that background. So I have to write a separate, much more detailed memorandum, with references.

Interviewer: You also reference in the briefing memo? Is there a standard form?

Respondent: No. It's just a memorandum telling why I'm doing something. I add the references just below. Therefore, the man who is reviewing it has my rationale for doing this. *Anything that I reference in the message, I'll have to show him because he is going to be interested in that. Now, how can we work that into your system? I've just explained something that almost invariably occurs. I rarely will send anything to the boss that I don't have references as a part of that overall package,* so he doesn't have to come back and say "what did Fleet say about this?"

Interviewer: These are in addition to the ones in the message itself?

Respondent: They may or may not be. I may have a comment going to JCS in response to their asking us for information. And all I want to do is send JCS that information. I'm not referencing Fleet's input in the message because JCS doesn't want that. They are interested in what CINCPAC says. I only reference, in my outgoing message, "JCS Request." But, I have gone out, to get my position for CINCPAC, to all the components, or necessary agencies. I want to know what they said because it's on what they said and what I think as to how my message is going to read. I've gone to the components and I've summarized their comments in the *facing message*. But I don't want to go through the whole drill of saying "CSG liked it, Fleet was ecstatic about it, PACAF -- eh about it." I've got to put those down there because the releaser wants to read what they have to say. He wants to make up his own mind what the feeling is, to be sure that I have encapsulated it, that I'm portraying CINCPAC's position.

It is the same thing within the staff. If I have a message that I am staffing, I have gone to the J2, 3, 4, and 5, and I have developed the staff's position. Then, I want to say the staff's position is this. But I don't want to summarize each of those, I want to hand them to the releaser underneath. So he says, "I wonder what J-- said about that." And he might shoot it back to me saying "justify why you've done this." You get into interplay within the staff. Now you do the same thing within J3. And the same thing within J3-. I might go to Reconnaissance, AW, OPSECT, Air, Ground, or whatever to get their feelings for it. And I encapsulate and put it all in my message or my position.

I may not always be talking about a message. I may be talking about a memorandum going to the Admiral. How do I handle those? Is that part of this system? I doubt it, you're talking about messages incoming and outgoing. You're not talking about intra-correspondence.

Interviewer: As a matter of fact, we're going to do that. A little later I want to talk with you about both formal and informal intra-correspondence.

Respondent: *That's almost more of my work than outgoing messages, because I spend 70% of my time doing intra-correspondence work,* reviewing an op. plan that comes from J5. They want to know, from an operations standpoint, whether it is any good. Then, I, in turn, send it out to people within J3- saying "What do you think?" What I have is the lead to put together J3-'s position. *So, I'm working intrastaff, I'm not talking about any message. My final copy will be a memorandum to the J3, perhaps, or a memorandum for the J3 to sign to the J5* saying "we like your op plan, it works." *I'm bringing this up at this point because I want to be sure that you guys can build something that we can use within the Headquarters, not necessarily between us and some distant point.*

Interviewer: Let me mention the kinds of things, in addition to the formal message service, that we were contemplating, and then we'll talk about them in more detail a little later. One form is a *pro forma* message form. Another is in-house record communications, just like the memorandum you've been

talking about -- office memos or any kinds of forms that you may work with. Another is informal traffic, where there is no accountability. It's more like a phone call, but secure. Yet another is linking directly from terminal to terminal, again like a phone conversation. So, those are some of the things we'll be talking about a little later on.

Respondent: Okay, that sounds great. Does that include an MFR -- memo for record?

Interviewer: It could include any text that you want to type in. It wouldn't apply to large, existing documents that were not already on-line.

Respondent: Anything that's prepared at the time to go out with it. *Could you store the point paper in a personal file?*

Interviewer: We could probably treat it as a comment to a message and keep it.

Respondent: Great. That's a plus three.

Respondent: How would I display it?

Interviewer: It could either be treated as a field of the message, but it really isn't, or you could ask for it explicitly.

Respondent: I like the feature of being able to see it on the CRT. A plus two.

Interviewer: When the message is released, what should we do with the point paper? Should it be discarded or saved with the drafter's comback copy, or what?

Respondent: *It should be fileable. It should be filed with the comeback copies to the internal distribution list.*

Respondent: No question about it-- plus three.

9.2 OVERALL COMMENTS ON THE MESSAGE DRAFT

9.2.1 A Question on Commenting the Draft Message

Again, with draft messages, you as a drafter may want to comment for those who may chop a message. They may want to send remarks back to you in addition to their ability to edit the copy that you're sending them. There are two forms in which comments

could appear. One would allow a place at either the top or the bottom of the message for a general comment on the entire message. We could also have specific comments associated with each field of the message, so that a reviewer could key his remarks specifically, say, to paragraph three of the message or to the distribution list or something like that. Would either the field-by-field comment or the overall comment be useful or not useful?

.

.

.

Yes, we talked about visually suppressing certain pieces of information where you can see them when you ask for them. Those comments might be handled in this way so that normally when you look at the draft of a message you wouldn't see them and you might push a button that says show me all those comments and the draft is then split apart and the comments inserted for your viewing.

9.2.2 Analysis of Responses to Commenting the Draft Message

Figure 9-2 shows the responses. *The overall comment was rated useful, yet the most frequent response was necessary (mode = 3).*

9.2.3 Remarks on Commenting the Draft Message

Respondent: *Frequently, if you watch these people at work, they'll be reading a message and paging through the refs at the same time. You'd have to have some kind of split-screen operation to make it satisfactory.*

Interviewer: We envisioned split-screen for viewing the original draft and an edited, returned copy. You could always hardcopy the references or you could use split-screen.

Respondent: You might want to consider that.

Respondent: Minus one. If you make it too easy for the "chopper" to make comments, he will. My feeling is that if he feels strongly about the message, then he should edit it. He has editorial license.

9.3 FIELD-SPECIFIC COMMENTS ON THE MESSAGE DRAFT

9.3.1 Analysis of Responses to Field-Specific Comments

Field-specific comments were deemed useful, mean = 1.5, see Fig. 9-3.

9.4 OVERALL COMMENTS ON THE RECEIVED MESSAGE

9.4.1 A Question on Commenting the Received Message

Those same sorts of comments could be applied to a message you receive as well. You could have a comments area at the top or bottom of the message and again field-specific comments. Let's say it's going on a readboard where people can send notes to each other, or you may want to make a personal note to yourself as a reminder of the status of action of that message. Would either one of those be useful or not useful for released messages that you've received?

Would you put that at the top or the bottom of the message?

9.4.2 Analysis of Responses to Commenting the Received Message

Figure 9-4 shows the replies which indicate that an overall comments area on the received message would be useful.

9.4.3 Remarks on Commenting the Received Message

Respondent: I think that would be good because I get the readboards back every day and they are always written all over. If it is the General's comment, you'd better see it first.

Respondent: I doubt if there is an action officer in this Headquarters who doesn't make notes to himself as to what he wants to do with it, or for posterity for the next guy coming across.

9.5 FIELD-SPECIFIC COMMENTS ON THE RECEIVED MESSAGE

9.5.1 Analysis of Responses to Field-Specific Comments

Field-specific comments on the received message rated only acceptable, with a mean = 0.9, std. dev. = 1.6, and mode = 1.

9.5.2 Remarks on Field-Specific Comments

Respondent: In fact that happened on three messages yesterday. On the first one they commented on who sent it because it was from an organization we'd never received a message from. The next one had a big circle around part of the text and a note saying ...

Respondent: *The General will underline a word or phrase. You should have an underscoring capability.*

9.6 NOTES ON A FILE

9.6.1 A Question on File Folder Comments

When we were talking about the file header information, we indicated that just after the file name there was an area for notes where you could type notes similar to writing on the back of a manila folder: comments or notes about the entire file of messages. Would that be useful or not useful?

9.6.2 Analysis of Responses to File Folder Comments

File comments were considered useful with a mean = 1.2, std. dev. = 1.4, and mode = 1.

9.7 REMARKS ASSOCIATED WITH FILE EXCERPTS

9.7.1 A Question on Commenting File Excerpts

And lastly, if you're looking at the header information on some file, you might want to add some number of lines of comments after one of these entries. This is not a comment associated with the message but just associated with the header. For example, you might insert the status of action of a particular message. Then, anytime you displayed those headers you would get the arbitrary number of lines of comments you had added. How would you rate this feature?

9.7.2 Analysis of Responses to Commenting File Excerpts

Comments on file excerpts was rated useful, with 14 of 18 respondents rating it highly desirable to necessary; see Fig. 9-5.

9.7.3 Remarks on Commenting File Excerpts

Respondent: That would be good, especially on daily digest type items. Someone could scan these and it says immediate action and then it has a note with a date-time group saying action completed.

```
code
  |
2. *********************** (    4)
  |
  |
  |
3. ************************************** (    6)
  |
  |
  |
  |................|........|........|........|
  0       2       4       6       8      10
        frequency

MEAN        2.600    MODE        3.000    STD DEV    0.516

VALID CASES    10    MISSING CASES    9
```
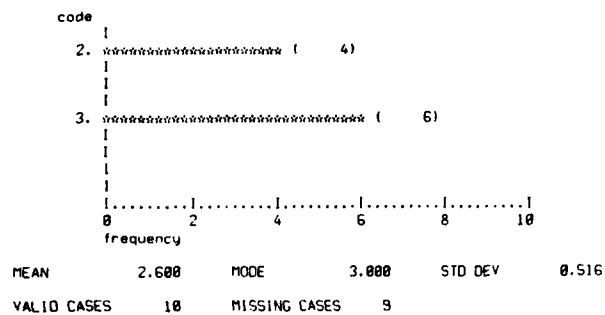
Fig. 9-1 Ratings for the Point Paper:
Excluding Administration Personnel

```
code
   |
-1. **** (    1)
   |
   |
   |
 0. **** (    1)
   |
   |
 1. ****** (    2)
   |
   |
 2. ****** (    2)
   |
   |
 3. **************** (    5)
   |
   |
   |
   |........|........|........|........|........|
   0       4       8      12      16      20
         frequency

MEAN        1.818    MODE        3.000    STD DEV    1.401

VALID CASES    11    MISSING CASES    11
```
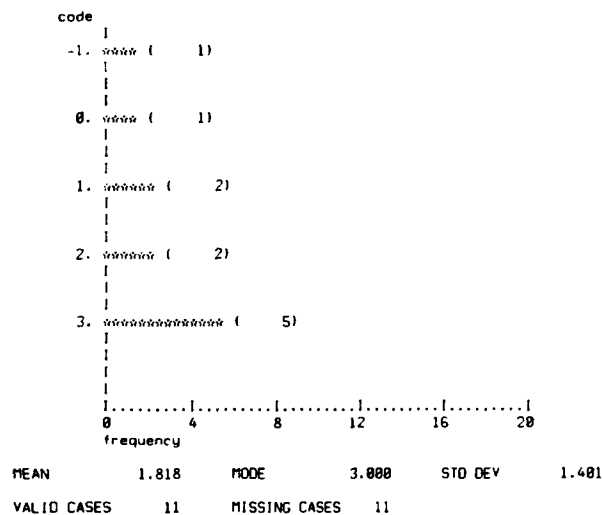
Fig. 9-2 Ratings for Commenting the Draft Message

```
code
   |
-1. **** (    1)
   |
   |
 0. ****** (    2)
   |
   |
   |
 1. ********* (    3)
   |
   |
 2. **** (    1)
   |
   |
 3. ************ (    4)
   |
   |
   |
   |........|........|........|........|........|
   0       4       8      12      16      20
         frequency

MEAN        1.455    MODE        3.000    STD DEV    1.440

VALID CASES    11    MISSING CASES    11
```
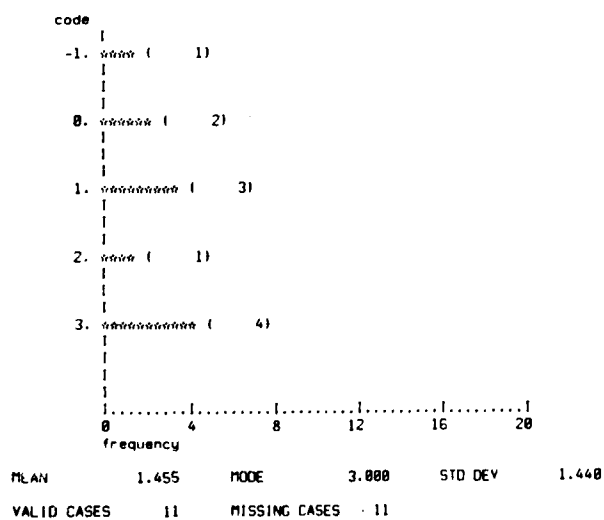
Fig. 9-3 Ratings for Field-Specific Draft Comments

```
code
   |
-3. ****** (    1)
   |
   |
 0. ****** (    1)
   |
   |
 1. ***************************** (    6)
   |
   |
 2. *********************************** (    7)
   |
   |
 3. ************************** (    5)
   |
   |
   |
   |........|........|........|........|........|
   0       2       4       6       8      10
         frequency

MEAN        1.600    MODE        2.000    STD DEV    1.392

VALID CASES    20    MISSING CASES    2
```
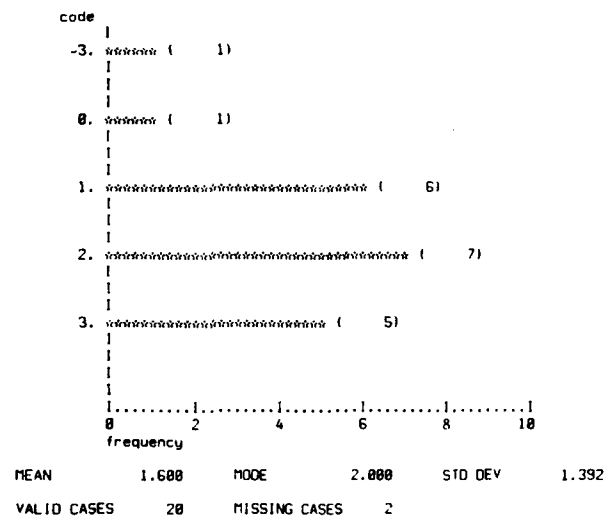
Fig. 9-4 Ratings for Commenting the Released Message

```
code
   |
 0. ****** (    1)
   |
   |
 1. ***************** (    3)
   |
   |
 2. ********************************************************* (   10)
   |
   |
 3. ************************ (    4)
   |
   |
   |
   |........|........|........|........|........|
   0       2       4       6       8      10
         frequency

MEAN        1.944    MODE        2.000    STD DEV    0.802

VALID CASES    18    MISSING CASES    4
```

Fig. 9-5 Ratings for Commenting File Excerpts

Interviewer: What does a daily digest item look like?

Respondent: A daily digest item has a date-time group, a subject, on the top of the sheet it indicates which section it is intended for, like J--, and then a suspense date.

Respondent: That would not be necessary but certainly highly desirable; plus two.

Respondent: Yes, that's a requirement, plus three.

Respondent: I wouldn't necessarily want them displayed each time.

9.8 TAGGING COMMENTS WITH AUTHOR AND DATE

9.8.1 A Question on Automatically Supplying Author and Date

One thing that can be provided with any of these forms of comments (since we know who you are when you're logged on) is that anytime you enter a comment in any of these areas we've talked about, we can automatically tag it with the author of the comment, and perhaps the date. That might be of greater value on group files like readboards, rather than your personal files. How would you rate that?
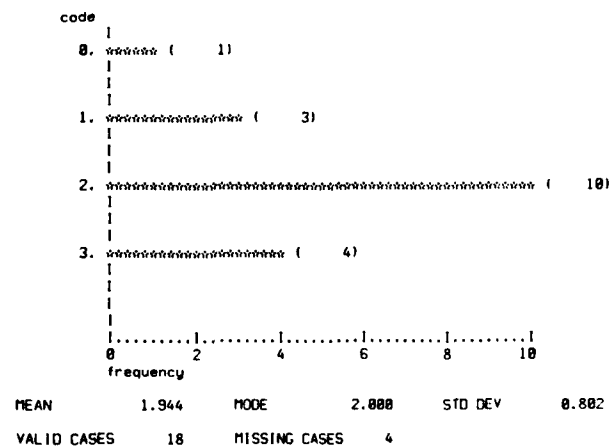
- .
- .
- .

The service would add your office code and the current date to any comment you enter, so you wouldn't have to type it. The purpose is that (let's use a readboard where a couple of people are making comments back and forth on a given message) it might be important to know who made the comment. If a general made it, it might be more important than if it were a yeoman.

9.8.2 Analysis of Responses to Supplying Author and Date

Seventeen of 18 respondents wanted author and date automatically generated by the service. One respondent felt it was acceptable.

9.8.3 Remarks on Automatically Supplying Author and Date

Respondent: There are times when someone tells someone else to take some action and they say "well, I don't remember it." If his dated code were on it there wouldn't be any problem.

Respondent: Author, yes; date, no, because I work in a real-time situation, so it's today.

Respondent: *The classification of remarks may raise the classification of the message.*

Respondent: *Could you have a key to get the date-time if you wanted it?* If someone came up with a comment last evening and I didn't see it until this morning, but in this morning's traffic his comment has been overridden by the message traffic. So, I just discard it rather than getting on the phone and saying "hey, I don't understand, did you see this last message?"

9.9 ACCESS CONTROL TO COMMENTS

9.9.1 A Question on Access Control to Comments

Now, let's address the question you had a moment ago about access controls. What kind of access controls should we apply to these different remarks fields? Let's say, for example, if we provide an access control facility you can apply it anywhere, to the comments on draft messages, to the point paper, any of these kinds of remarks fields. Here are the kinds of things that we could provide. One is what we've been saying, everyone who has access to a message draft or file has access to the remarks unless you say otherwise. The second policy we could adopt is that no one has access unless you explicitly say so. And the third policy is that if anyone can access the message they can access the comments.

9.9.2 Analysis of Responses to Access Controls

Nine subjects preferred that the default be that comments are restricted. One felt that the default should be open comments. Eight didn't care.

9.9.3 Remarks on Access Controls to Comments

Respondent: It would be highly desirable to have a place to put a controlled comment just for our office. They may want to know which operator routed

the message. For example, down in the internal distribution block, you would want a place where you could put OPERATOR 1 or OPERATOR 2, and we only want that to be seen by our office.

Interviewer: Would you prefer to state which offices could see it or which ones couldn't?

Respondent: Which ones could see it. This would be used for quality control to see who is making what kind of mistakes. And if they continue to make them, why. But it is really just for our use.

Interviewer: Make up an instruction to show that the comments have limited access.

Respondent: COMMENT RESTRICTED TO J-- AND J--.

Respondent: State a group of office codes that it is restricted to.

Respondent: No one can unless you say they can. I would want to do this on a message-by-message basis.

Respondent: Yes. And such controls are highly desirable.

Interviewer: Should it be such that anyone who could access the message can see the remarks unless you restrict it, or no one can unless you explicitly indicate they can?

Respondent: Anyone can unless you restrict it.

Respondent: If it is something I write on there, then I make a decision as to who it is for. It may be strictly internal. It ought to default to open unless you say it is restricted

----

Respondent: The comments should be restricted. You need control over your comments so that you can pass them to whoever you want to, but everyone can't see them. I think that is very desirable. I think I, as the user, should specify who should see it.

Respondent: Is there any way that you could treat notes as a message in

themselves, general notes or something of that nature where you would be building those and adding to them throughout the period that you may be working on a particular project?

Interviewer: There are some other forms of communication such as the office memo that I haven't talked about yet. But assume that you can do that -- that you can have something that is really detached from the message.

Respondent: See, these might not apply to any of the particular messages, except in a general way. But they would be very important to you if you owned the file, to give continuity and to point out sources of information that you've used in making up the message -- a private note pad.

9.10 INTERPRETATIONS AND RECOMMENDATIONS

The point paper is recommended. Respondents were willing to have the service treat it as text only; any structure would be typed by the person inputting the point paper. As highlighted by italics, subjects would like to file it and have it return with the comeback copy.

An overall comments field is suggested for both the draft message and the released message. Reaction was mixed as to whether this comment should appear at the top or bottom of the message. One argument put forth for placing it at the top was that if the General wrote it, you'd better see it first. An argument for following the message with the comment was that it simply made more sense to read the message before reading the comments about the message.

Field-specific comments on the released message was not supported by the respondents. For draft messages, they were, slightly. We recommend neither its presence nor its absence. If it is provided, we strongly recommend some form of binary suppression control (see Chapter 3) because it was clear that most users would want to be able to see the message in a form closely resembling the standard format.

We do recommend an underscoring capability for both the draft and released message. Underscoring and circling are apparently prevalent forms of highlighting message parts.

We feel ambivalent about the file header comments. It was barely rated useful, yet it probably adds very little to the implementation task. *Comments on file excerpts was also rated only useful. Yet, the impression we received is that the subjects were much more enthusiastic about the file excerpt comments. Most of them suggested uses for this feature. Fourteen of 18 rated it highly desirable to necessary. We'll go along with the majority and recommend file excerpt comments simply because of the feeling we came away with; that it would be most useful to most of the subjects.* If this capability is provided, thought should be given to one respondent's request which was that he would like a suppression control.

Comments in all forms should be tagged with the author. Date would be useful to all except those working in the command center. Time is important to a few.

One subject pointed out that a comment could raise the classification of the message. It is not clear to what extent the utility of electronic comments drops if no attention is given to this issue, for the 1977 test. It is certainly an issue to be addressed prior to an operational system.

Access controls are needed. With evenly divided opinions, it would be nice to have a user-settable, binary-valued parameter such that users could set the default either way they desired. The domain of the control should be compatible with that of the comment. For example, access should be specified on a message basis for comments on messages, and on a file basis for comments attached to files or file excerpts.

10. A PERSONAL ALERT MECHANISM

The military community must be responsive to their message traffic. The immediacy of attention given a message is a function of its precedence, subject matter, and other variables. The computer can reduce information, analyze it, and respond in a number of ways. Thus, in this chapter we investigate the need for individualizing an alert mechanism whereby the user can specify the combination of message events and notification media for alerting. Specifically, three questions relative to alerting were prepared. What events need trigger alerts and how should the user be informed? Is it desirable to extract user-determined information from an incoming message so that the alert might be more informative? Since the alert is presumably important, how should the service handle the situation in which the user does not positively acknowledge the notice? These questions comprise our problem for this chapter.

10.1 PROGRAMMED EVENTS

10.1.1 A Question on Programming Alert Events

We'd like to talk now about those conditions under which something important comes in and you should be notified in a hurry. I want to show you the ways in which you might control the kinds of events you're alerted to, and the mode of presentation of notice information.

We've indicated that there is a reserved area on the top of the screen that would be used to alert you to certain conditions. We would envision that when you first begin to use the service that you would fill in a chart something like this (Fig. 10-1), that would indicate the conditions to which you wanted to be alerted, and the way that you would want to be alerted to those conditions. A list of some typical kinds of events appears in the right hand column. This list is not exhaustive, but it suggests some of the things to which you might want to be alerted. For example, if you had an incoming action message there are a number of things that could happen and you specify in each of these columns in this row, the conditions under which you would want to hardcopy, ring the terminal bell, or display a notice in your reserved area. This would be based on message precedence. For example, if you put a Z in here, any action flash message would automatically be hardcopied. Insert an R and any routine or higher precedence message (in other words all incoming messages) would be hardcopied, and if you put an O in here, any immediate or higher precedence message would be hardcopied. If you put nothing in there, then they wouldn't be hardcopied. The same thing applies to the bell. There is a bell on the terminal which will ring for you in case you're not looking at the terminal right at the time traffic arrives. Again, you'd determine the precedence for this occurrence. If you have an incoming action message, for example, and you put a Z in here any flash action message will ring your bell. If there's an R, any routine action message or higher will ring the bell. If no code appears, then the bell will not ring under these conditions. Here you can indicate exactly what you want to have displayed in the reserved area, as well as the conditions for it. As an example, suppose you get a draft message coming in for your chop. In this example, for any immediate or higher precedence message that comes for review, this notice would be printed in the "window." You type here exactly what you want as a notice. As we've indicated here, it would say DRAFT FOR REVIEW FROM, then it

would pick out the drafter field and insert that, and pick out the subject field (30 characters of it) and insert that. When an immediate draft message comes in, you get this statement (up here) (Fig. 10-2) that you specified, DRAFT FOR REVIEW BY, the drafter J311, VISITING CONGRESSMAN. This chart, as I say, is something that you probably would fill in only once, when you first begin to use the service.

There are some alternatives. One alternative is that you're automatically alerted to every incoming message. Every event causes an alert. Another alternative is that you are never alerted to any message coming in. It's simply put into your PENDING file and then you examine the PENDING file, as desired.

How would you rate the facility to select the events to which you are alerted?

10.1.2 Analysis of Responses to Programming Alert Events

Event selection was rated highly desirable (mean = 2.5), with the most common reply being necessary (mode = 3), see Fig. 10-3.

10.1.3 Remarks on Programming Alert Events

Respondent: It is necessary to say what we're alerted to.

Respondent: I would definitely want it programmed as to specific things, like immediate messages, as an example.

Respondent: I think that is absolutely necessary.

Respondent: Since I work in a real-time environment, this is an absolute necessity. We get every immediate and flash message at the same time the comm center gets it. The reason the command center exists is to act on messages as they come in. A perfect example was the Mayaguez. We got the first flash critics, and within minutes we had people in action.

Respondent: The alternatives are unacceptable. This kind of facility where I have the capability to establish the kind of criteria I want, is a necessary requirement because, for example, if I get a flash action message I've got to be alerted right now. I want both an audio and a visual notification if I can, and if I get an immediate for action then I'd rather just have a visual. *If it can be done in this system without a whole lot of difficulty, I think we should have some kind of alert system based on the criteria primarily of*

	HARDCOPY	TERMINAL BELL	DISPLAY DISPATCH
			1

1. Draft for Review
   "Draft for Review by"
      DRAFTER "on" SUBJECT(30)

2. Draft Returned from Review

3. Message Released and Transmitted

4. Incoming Message for Action

5. Incoming Message for Cognizance

6. Incoming Message for Information

7. Specified date-time has Transpired

Bell frequency in seconds: _____

Bell duration in seconds: _____

Fig. 10-1   Alert Event Form

Draft for Review by J31 on Visiting Congressman

Fig. 10-2   Display of Alert Notice

precedence, with a follow on as to the subject matter. If I'm looking for a priority, a query that I sent to Fleet, they may send it to me priority and maybe not, but my problem is close time constraints of meeting a suspense to the J3. That is almost a flash to me. So, I want to be able to establish a subject criterion for it, even though it is only coming in as priority, or even routine. I might be met with a "suspense crunch" which to me means that when I get that message I'm going to react right now.

Respondent: You are really going to use F and I? That is different from what everyone else uses -- Z for flash, O for immediate.

Interviewer: Yes. That's in NTP-3 [NTP-3]. In the figure it was an oversight on my part.

Respondent: *You must have a light. You can't have a bell just behind the briefing room.*

Respondent: Assume you were in the middle of doing something else and a message came in and went into the PENDING file, and you were expecting the message, also assume that we are going with the third alternative, (no alerts; notices are placed in the PENDING file). *Let's say you are in the middle of drafting something, perhaps, or looking at some other messages and you want to just stop that and take a quick took at your PENDING file to see if what you're expecting has come in. Is there an easy way to do that and then come back to what you're doing so that you don't lose what you composed or lose your place if you were going through a readboard?*

Interviewer: We had envisioned something similar to that, where you are, in fact, looking at a message and let's say you get a notice and it is of higher precedence than the message you are working on, and you want to attend to it and then come back to where you were. We could have buttons like NEXT, PREVIOUS, and so forth that would allow you to do those things. A single button could mean "put away what I'm doing, but mark my place, and give me the new message that I've been alerted to." Then after I've finished the new message, a button that means "go back to where I was." If you had a series of these interrupts it would operate like a cafeteria plate stack in that the most recent one you left (the plate on top) would be the first thing you would return to (like taking off the top plate): last-in, first-out. What you're asking for is similar but you would have to establish the new context by asking for your PENDING file after pushing the button to mark and save what you have.

Respondent: I would need the ability to go to something else and come back. ... I'd say a bell with a volume control on it would be good.

Interviewer: What we envisioned was that you could specify the frequency

and duration of that bell. And also perhaps an off/on switch on the console so that if you are in the office and going to look at the screen once in a while, and you don't want to be bothered by the bell, you could turn off its effect.

Respondent: Sure. A recorded message might be good. Like *Ansaphone.* It could say you have so many messages on subject such and such.

Interviewer: That's interesting -- the message count. But if it says you've got subject such and such, that's perhaps getting beyond the state of the art.

10.2 PROGRAMMED NOTICES

10.2.1 A Question on Personal Alert Notices

What about tailoring the alert notices to exactly what you want to see? As we've shown in this example (Fig. 10-1), you could give literal text and also pick up contents of message fields. How would you rate the utility of this feature?

10.2.2 Analysis of Responses to Personal Alert Notices

Overall, personalized notices was rated desirable (see Fig. 10-4), although the most frequently occurring response was highly desirable. There was a significant difference between the responses of officers (desirable, mean = 1.2) and those of enlisted personnel (highly desirable, mean = 2.2).

code
```
  1. ***** (    1)

  2. ********************* (    9)

  3. ***************************** (   12)

     I.........I.........I.........I.........I.........I
     0        4        8       12       16       20
     frequency
```

MEAN	2.500	MODE	3.000	STD DEV	0.598
VALID CASES	22	MISSING CASES	0		
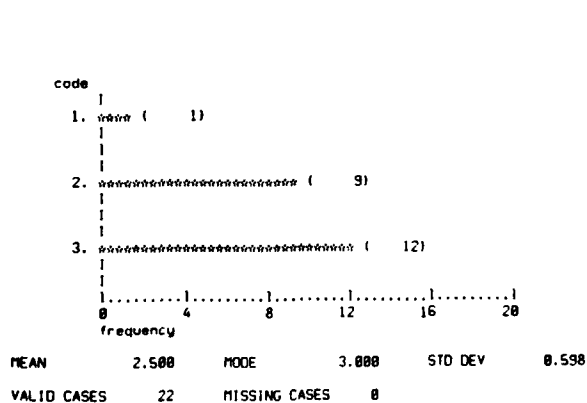
Fig. 10-3 Ratings for Programming Events

code
```
  0. ******************* (    4)

  1. ******************* (    4)

  2. ************************************************************ (   10)

  3. ******************* (    4)

     I.........I.........I.........I.........I.........I
     0       2        4        6        8       10
     frequency
```

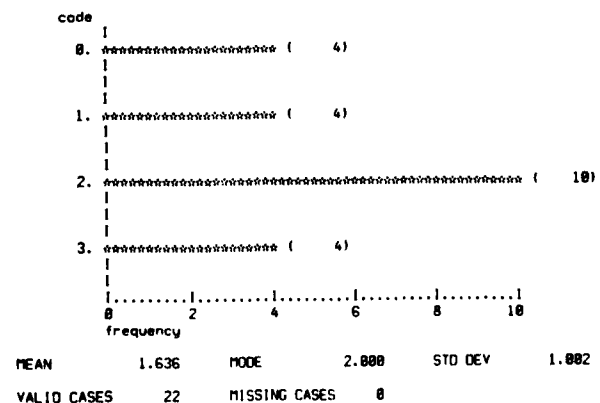| MEAN	1.636	MODE	2.000	STD DEV	1.002
VALID CASES	22	MISSING CASES	0		

Fig. 10-4 Ratings for Programming Notice

10.2.3 Remarks on Personal Alert Notices

Respondent: Why have a display if you're getting a hardcopy?

Interviewer: That's an option, whether you get a hardcopy or not. And the reason for giving you the alert rather than the message itself is that you may be in the middle of working on something else on your CRT. And you may either choose to respond to the alert right now, or ignore it and look at it in your PENDING file later. You determine your priorities, rather than having the system do it.

Respondent: Being the staff we are, we respond to any action message. I want the terminal bell. But I see no reason to display it if I've got hardcopy. If, in fact, the situation is that I am busy doing something else, why should I tie up the CRT with a display?

Interviewer: One of the things you might be doing is looking at messages; that's what the CRT is there for.

Respondent: Yes, but now I've tied it up for 10, 15, or 20 minutes looking at a message and something else might be backlogged for display.

Interviewer: That is why we're giving you the alert "window" at the top: to tell you what's coming in, and to allow you to tell us what fields you want picked up from the message and shown there in the top line, so that you can intelligently decide if the new message is of higher interest. And if it is, you can go work on the higher priority item.

Respondent: Okay.

Respondent: That would be good. We have many different messages coming in from the components, from JCS, or whatever. You'd be able to determine what that is. It's going to save a lot of time.

10.3 UNATTENDED ALERTS

10.3.1 A Question on Handling Unattended Alerts

What about unattended alerts? Let's say that in response to an incoming message the service displays a notice or rings the bell, or whatever you have specified. Let's say that you don't respond by saying show it to me, or hardcopy, and you are not busy doing something else with the terminal. As far as we can determine, you are away from the terminal. One thing we could do it to repeat the alert periodically. Another thing we could do it route it to another office code or another terminal, or we could hardcopy. In any event, it would be put in your PENDING file. What would you advise for your situation?

10.3.2 Remarks on Handling Unattended Alerts

Respondent: It would be better for me if you just flashed the notice until I acknowledged it.

Respondent: If you go down the hall, you might have several of them backlogged when you get back. It would be nice to be able to specify certain messages to come up first in your PENDING file. In other words, anything that was immediate or higher.

Interviewer: Would it be sufficient to put all newly accumulated messages at the top of the PENDING file and flag them to indicate that they had arrived since you last looked at the PENDING file?

Respondent: Right. Something to say that these have been added since the last time you examined it.

Respondent: You could give subjects and corresponding office codes so if a message comes in on a subject, it would be sent to that office.

Interviewer: We could do this through the automatic filing by subject and implied routing by the file header instructions.

Respondent: We're in there 24 hours a day just to monitor this kind of thing. The only reason that I wouldn't respond to that alert is if I were talking to someone about something important, which means, that I'm still interested in this and I want to see it but I don't have time now and I'll get to it in a few minutes. So, for me, I'd rather keep the alert there.

Interviewer: If you have many such alerts, we could then repeat them, cycle through them until you respond.

Respondent: Yes. That would be fine. A staff agency might want to do that differently.

Respondent: For example, say we have an action message for J4 and it comes in after normal business hours. That same message has to come in to the command center where an appropriate individual would review it and take it off the machine as a result of some other type of action he's done; either called the J4 duty action or deferred action until the following morning.

Interviewer: It should be rerouted to another destination?

Respondent: Maybe not rerouted, but multiply routed.

Interviewer: Really multiply routed? If it occurs during the day and he is there, then you don't ordinarily want to be bothered with his traffic, do you?

Respondent: Right.

Interviewer: So, you only want his traffic routed to you when he goes home for the day?

Respondent: No. Even though a message might come in for an action agency in the Headquarters, the command center is still concerned with it as a matter of information, so they would still want to see it on that basis.

Interviewer: Let's see if I've got it now. You both get a copy. But now he has gone home and it is for his action and so we need to now give you some kind of an alert telling you to take action.

Respondent: *Maybe that could be automatic: when he leaves he could push a switch on his terminal that would kick in the command center to get visual and auditory alerts.*

Interviewer: Okay, we're rerouting the *alert*; you already get a copy of the message. Should that be directed to you on the basis of your terminal *identification or your office code,* or what?

Respondent: You'd be directing it to a terminal. We can't move around.

Interviewer: Is the same office code associated with that terminal, all of the time?

Respondent: All of the time. Yes.

Interviewer: So in your case they are one and the same.

Respondent: The last digit of the office code would change depending on which team was on.

Respondent: Cycle it into the PENDING file.

Respondent: Periodic redisplay. If necessary, I would specify rerouting to someone else in my office.

Respondent: Anything that comes in that is immediate or flash, you'd better get it to somebody. It also depends on the message, what it is.

Interviewer: What kind of mechanism is needed? One facility could be that you could specify rerouting instructions such that if you don't respond within a certain time period, depending on its precedence, it would go somewhere else. And you're saying it depends on the subject matter as well.

Respondent: Without getting needlessly complex, that would suffice for me -- subject matter and precedence. I have a duty officer and he will ordinarily be there, so it could ordinarily be rerouted to him, or if he isn't there then it could be rerouted to the Duty Director for Office, the DDO. *I think you'd have to have more than one --- perhaps string these together so that if he isn't there it goes to whoever he specified.*

Interviewer: It isn't much more difficult, with the code that is needed for other functions, to do it very generally. Once we allow you to specify one of these fields such as precedence or subject, we could allow you to specify any of the parts of the message that we can scan -- we mentioned that same mechanism for retrieving messages. We could use that same programming in this context. The same is true for routing -- the routing we use for a distribution list or for getting a message chopped could be used. So, it isn't much more difficult to provide the elaborate mechanism, once we provide anything at all.

Respondent: People may work differently in different parts of the staff. So, I think it should be the way *you* want it.

Respondent: A light on top of the console that stays lit. With the offices here, if you get a ding-ding every 30 seconds, that's not good.

Respondent: I'd like to see the alert repeated until it was acknowledged. And I'd like to see a capability to route it to another office which you could type in when you knew you were going to be out of your office for an extended period, to cover your absence. It would go to someone else that you had told that you would be gone. The light sounds good, then the bell couldn't keep ringing.

10.4 INTERPRETATIONS AND RECOMMENDATIONS

We recommend the programmable event feature. No one objected to the matrix form for specifying event types. Evidently, it would be useful to trigger notices not only on precedence, but on other message parts as well. This is not essential, yet there should be commonality of the code used for filing and retrieval operations. Several respondents suggested a light as an auxiliary alert medium. We support their suggestion.

Although the programmed notice was desirable, and we feel that is would be very useful, it is not essential.

The preponderance of subjects wanted to handle unattended alerts simply by repeating the alert until acknowledged. Yet, some indicated the need for alternate routing; their remarks were given earlier in this chapter.

11. THE DRAFT MESSAGE REVIEW PROCESS

This chapter concerns some of the facilities associated with message preparation. Thus, the questions were asked primarily of those who are involved in the message drafting process. It should be used in conjunction with the Washington report [Heafner 76]. We highly recommend reading that report in regard to draft preparation. There is one notable difference in opinions of the subjects of this study and the Washington study, namely, with respect to distinguishing fields of various kinds of reviewers.

11.1 MAINTAINING A SINGLE VERSION

11.1.1 A Question on Automatically Deleting Old Versions of Drafts

Rate the following feature. As a new version of a draft message is composed, it automatically replaces the previous version. For example, if you draft a message and have it reviewed by two people, then you have three versions: your original and the two reviewed versions, perhaps edited. If you then modify your original based on recommendations by the reviewers, the modified version replaces your original, and you would still have three versions and not four. You, of course, have the ability to save any old versions in your personal files. Rate this feature of having the service automatically delete your previous version.

11.1.2 Analysis of Responses to Deleting Old Drafts

Respondents rated this feature highly desirable, mean = 2.0. As expected, there was a significant difference in the responses of action officer support personnel (highly desirable) and message distribution personnel (acceptable).

11.2 DISTINGUISHING THE REVIEWERS

11.2.1 A Question on Distinguishing Kinds of Reviewers by Field Names

I would like to talk about the review process of draft messages. In situations where you're drafting a message, internally you get chops or approvals. Also, that message may impact another organization outside the originating organization, and there may be times when you send that draft over for courtesy comments, since it impacts them. Is that a mode in which you operate? And would you like to distinguish on the draft message itself those two kinds of reviewers: those people within your organization who must approve, who chop it, and those outside who have no control over your sending the message, but who receive a courtesy copy for their comments?

11.2.2 Analysis of Responses to Distinguishing Reviewers

Only two persons wanted to distinguish among reviewer types. Contrast this result with the Washington respondents [Heafner 76]. The reason given for the "no distinction"

answer was that people outside their immediate organization also, in general, approve or chop.

11.2.3 Remarks on Distinguishing Reviewers

Respondent: No need. People outside also chop it.

Respondent: Who they are; that will tell.

Interviewer: The org codes tell you? You wouldn't need separate fields on the message?

Respondent: It's not necessary. No. If it's J5, I know who they are.

Respondent: Sometimes we write a message and they say "Hey, get PACAF, PACFLT chops." Even though they don't have any control over what we're going to say, our boss says "Well, we can't send that unless we have concurrence."

Respondent: I think we ought to have the capability of going either for comments or concurrence or for info.

Interviewer: We're talking about the drafting process. Do we need info?

Respondent: Yes. If they want to comment they can.

Respondent: *In some cases they do have control over the content of the message. In many cases a message will come into the Headquarters that impacts two or three areas.* One may be policy and one may be operations, for instance. It may be a composite message on policy and operations. The policy portion of the message has to be coordinated by J54 or J5 and it doesn't go out without their coordination. We can't properly answer the mail, so to speak, unless they coordinate on the content of that particular portion of the message.

Respondent: I have difficulty visualizing the need for separating the two classes.

11.3 FEEDBACK TO THE DRAFTER

11.3.1 A Question on Keeping the Drafter Informed of Message Status

Now we have a question of feedback to the drafter. In earlier investigations, some people have indicated that, as a drafter, when they send the draft out within their own organization, they don't want to be bothered with it unless there is a problem with it and it comes back for redraft. Others say that they want to know exactly where it is and what's happening to it. They want the feedback at each stage in terms either of getting the message back or an alert on their CRT. Which camp do you fit into?

11.3.2 Analysis of Responses to Informing the Drafter

Each respondent wanted feedback, either as an alert or as the ability to query status.

11.3.3 Remarks on Informing the Drafter

Respondent: I would like to know whether or not the person I sent it to got the message.

Interviewer: One facility the service could provide is to tell you whether or not he has displayed the draft or hardcopied it.

Respondent: I would want an indication that he has gotten the message, first of all, and then wʰ.ther or not he has any comments. If he doesn't have any comments I want to know that too.

Interviewer: Would it bother you, as a reviewer, if someone sent you a draft, for them to be told that you hadn't displayed it yet, or that you had?

Respondent: No, it wouldn't bother me.

Respondent: I don't want to send it out and have it die or get lost. I want feedback. ... I'm not interested in the chop. What I am interested in is it getting everywhere I sent it. And if there is a dissension, an adverse comment, I want to know about it. Because it's my responsibility to "bird dog" a message. My job was not to submit it to my boss, my job was to get the job done, and that includes a complete cycle.

Interviewer: So, you'd like to be alerted as it goes to each person for their chop and when someone chops it?

Respondent: Yes. It's my job to get that message through, and if somebody is sitting on it in their "in box," I want to know.

Respondent: That is necessary. You have to be able to keep track of your papers. ... If there is any change it should come back. Maybe it could work on the precedence of the message. If you're drafting a flash, you want to know where it is and if it is hung up someplace you need to go fix that. If no one has changed it but it still hasn't gone, somebody is sitting on it, then you need to see that person.

Respondent: A lot of times the question is asked, when you've got a message out for chop, "Where is it now?" It's not so much that you are interested in what's been done to it, although sometimes you are. It goes from A to B for chop and back to A, and you bypass B because you made his correction. You go A to C for chop, he changes it around, it comes back. You go A to D. Sometimes it goes like that. Other times it goes straight through in serial.

Interviewer: (It was suggested that perhaps the status could be highlighted by higher intensity when displaying the message draft.)

Respondent: Yes, because you can keep track of it that way.

Respondent: I think it is important to know what the status of it is, and whether it has gone out; if not, you find yourself running in circles.

Respondent: I would prefer to get notification. How would you find out where it was, if someone got it and kept it, for instance?

Interviewer: (Proposed chop list structure and operation was explained, along with notification, query, and highlighting of circle chops.)

Respondent: Very good. Beautiful. I like that. Beautiful. I like that very much. I don't like the notification, all I want to do is query.

Respondent: I want feedback at each stage as an alert, or put it in the PENDING file.

11.4 DRAFT MESSAGE CONTROL

11.4.1 The Question of Who Controls the Draft Message

We have a problem with the control of draft messages. I understand that if you're drafting a message and you're sending it up, your superior can do lots of things with the message. One thing he can do with it is to make what seems to him a minor change, chop it, send it on up and out. And he may or may not inform you that he's done that. To circumvent this, some drafters hand-carry the draft around now in a serial fashion so that they are aware of any changes that are made. Because, in the first case, the message that was released wasn't the message you drafted, yet you're responsible for it. Does that situation ever occur here?

.

.

.

The point is that it's easier to make changes to the message than it was before. Let's assume that the drafter says to the service, any time there is a change made, I want to be notified in some form. I want to get it back or something. The supervisor says, I want to change this and send it out just like I've done in the past. These are conflicting requests to the service. What procedure should we follow, in your opinion?

11.4.2 Remarks on Draft Message Control

Respondent: I would recommend that it be changed by the drafter and then sent back to the releaser. The drafter has control.

Respondent: They'll all tell you. They love to tell you when it is wrong. Few bosses will unilaterally tell you you did a good job when they've changed the whole last paragraph. They love to tell you bad news. Good news they don't tell you.

Respondent: I think it should go back to the drafter unless the person who changed it makes a specific determination that he is going to send it up and then it ought to change to him as the drafter. Once he fiddles with my paper, he has bought it as far as I'm concerned.

Respondent: My recommendation is that when any change is made to a draft, it can't go anywhere. It has to come back. It's the drafter's message. It shouldn't be controlled by someone making a chop and then forwarding it on.

Respondent: Control with the drafter. My experience has always been that if someone up the line has changes, they have you in there about the changes.

Respondent: It's been my experience that when a message is going to be changed, the drafter is called in. "This is the change we want to make. Do you think that changes the meaning of the message?" But I think the guy who originates the message should be in control of it.

Respondent: I really think that answer should come from J3 and above. That's an internal procedure that the Headquarters is going to have to live with. I personally like to know what's going on with the message.

Respondent: Yes it does. But it is rare because you usually have to retype it.

Interviewer: (Ease of change was described.)

Respondent: This is dangerous. That's a very profound question. You might possibly be able to rationalize around a situation where the original drafter might have to corelease along with the actual releasing authority, if it were done entirely through electronic means.

Interviewer: (Alerting was described as an alternate.)

Respondent: In practice, it seems as though the original drafter would have to sit "glued to the scope," anticipating anything like this happening, from the very time he submitted the draft for review until it was released. He couldn't afford to get up out of his chair for fear of something like that happening to him, unless he had some way of seeing the final copy before it went out. That is something he'd have to do regularly. ... I don't think there would be any qualms on the part of a releasing authority to admit that perhaps the action officer or the originator of the message could have a little more expertise in this particular subject area than the releasing officer. I think he'd be willing to admit that the drafter ought to be able to look at the final message before it is released, even though the releasing authority has a prerogative of overriding what the drafter has said. It's a procedure that would have to be agreed to and it would have to be built into the system, I think.

Interviewer: If it is built into the system, then one of them has final control --- not both.

Respondent: Have you heard of the two-man concept?

Interviewer: Yes. We could certainly do that kind of thing, but we'd like to avoid building as much of that kind of protocol in as possible.

Respondent: Of course, there could be options. The drafter could waive any rights he has to see the final copy before it goes out, if he felt that there wouldn't be any problem like this. Or the releaser could accept full responsibility for any changes he makes and not feel that he is putting the drafter on the spot.

Interviewer: In practice that is not the case, is it? Isn't the drafter responsible for an incorrect message going out?

Respondent: Again, that is a complicated situation. ... You might have a deeper involvement and not only want to cover yourself but the Command as well. I think you'd have to have some procedure for doing that. But like you say, it could be procedural and not built into the system.

11.5 DELEGATION OF AUTHORITY

11.5.1 A Question on Delegating Review Authority

What features are needed for delegating review authority? For example, as a reviewer, if you delegate authority to someone to review a message for you, after he has finished the review, does the draft go directly back to the drafter, or does it go back through you first? Or is it sometimes one way and sometimes another?

11.5.2 Remarks on Delegating Authority

Respondent: Always bring it back to me.

Respondent: So rarely is responsibility for chop delegated that delegation -- if there -- is inherent in the job one holds. I don't believe that has a part in this.

Respondent: It usually comes back, but not always.

Respondent: He continues it in its chop chain, wherever it is going.

11.6 THE CIRCLE CHOP

Closely connected with the delegation of *review* authority is the delegation of *chop* authority. Such a chop is presently indicated on the draft message by circling the office code of the person for whom one is chopping, and then initialing the draft. This issue, although not initially appearing on our questionnaire, was raised by several subjects.

11.6.1 Remarks on the Circle Chop

Respondent: *All the staff procedures that I have seen have a provision for (if you know that someone concurs on a message) circling him and putting on your own initials. We have to have some sort of mechanism to do that here, where it will be apparent later that Colonel ----- did not see the message but the drafter knew that he concurred and circled him.*

Interviewer: Do we need to input some master list to start with, indicating the structure for circle chops?

Respondent: No. It just needs to be able to show next to the code.

Interviewer: Then I shouldn't restrict it in any way. I should let the drafter do that for everyone?

Respondent: Yes. The releaser has to make the decision as to whether it is satisfactory or whether he wants some particular individual to see it.

Interviewer: So, it applies to everyone except the releaser? You certainly couldn't circle chop the releaser.

Respondent: That's right. *Also in this staff, sometimes a message has to be released before you can get an out-of-division chop.* When you deal with J-, they are very strict about that.

Interviewer: To indicate the circle chop we could do something like underscoring. For example, after someone has chopped, we might put their codes in dim intensity so that when you looked at it you could easily tell who hadn't chopped. So, we might underscore to indicate a circle chop.

Respondent: And then you'd need to show, next to it, who did that.

Interviewer: Okay. We could do that in parenthesis following the underscored code.

Respondent: *What about J4 and J5, how are you going to indicate their chops? They don't have terminals.*

Interviewer: Probably what you could do is to put their codes on there and

you could indicate their chops by circle chops, after sending and getting back a hardcopy from them. Or perhaps you need something slightly different to indicate that they did really chop but that you are indicating that on the electronic message.

Respondent: I think what it means is that you are going to have to have a hardcopy for everyone because you can't have one version of the message that's chopped by half the people and one chopped by the other half.

Interviewer: You can indicate on your electronic copy that those people have approved it.

Respondent: Oh sure, you can do that now. You don't need to chop with anyone, you can just fake all the signatures. How are you going to guard against someone who's in a hurry?

Interviewer: When you do that, we can indicate that it was entered by you, different syntactically, but similar to the circle chop where you as a different office code are chopping for someone, we'll indicate that by underscoring and associating your code with it also. So, everyone will know that you entered the chop for that guy.

11.7 STRUCTURE AND OPERATION OF THE CHOP LIST

The following paragraphs are excerpts of descriptions given to those subjects interested in the draft message review process.

Let me describe the chop list and get your reactions to some proposed features. You said that you would make no differentiation between those who provide courtesy comments and those who approve. So, let's talk about this (Fig. 11-1) top part as a field of the message and assume that it is labeled CHOP LIST. I really want to talk about the way it functions. If you enter codes on a single line the draft would be "shotgunned," that is, sent to these people in parallel for their chops. Where codes are entered on different lines (in a column) that means that the draft goes to these people in serial. Here, it goes to this guy and then this one and finally to the releaser. Is that a reasonable way to specify the combination of parallel and serial routing?

.
.
.

Yes, we assumed you might want some overrides. If, for example, after you have gotten some comments back, you want to skip this guy because, well, maybe he isn't going to be in this afternoon, and you want to go ahead and send it up here and back to him later. Rather than rewriting the list, when you press the SEND FOR CHOP button, you can type in explicit codes before pressing EXECUTE, and this has the effect of reordering or changing the routing.

Another feature that people have mentioned that they want is the ability to indicate a circle chop, where you would underscore the office code that you now circle, and then the service would parenthetically indicate the office code of the person who provides the underscore. This is equivalent to your presently providing your initials.

.
.
.

That's right. You as the drafter want to easily interrogate the status of chops. One way this could be indicated is as follows. When someone decides to chop, he would push the CHOP button, and then his office code would be displayed in dim intensity rather than bright. Now, this gives you, the drafter, a quick visual means of determining who has or has not chopped. To query the status you simply display the draft and the difference in intensities stands out right away.
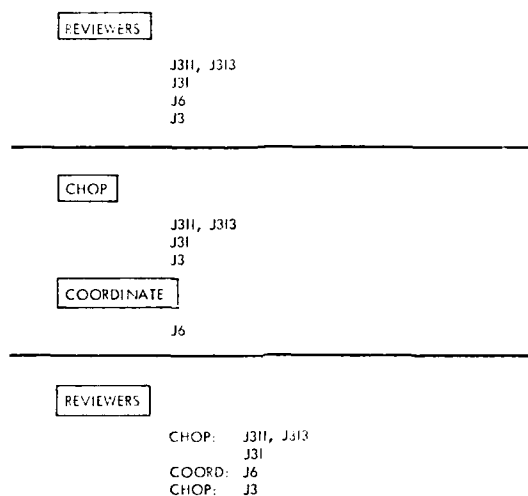
```
            REVIEWERS

                  J3II, J3I3
                  J3I
                  J6
                  J3
  _____

             CHOP

                  J3II, J3I3
                  J3I
                  J3
            COORDINATE

                  J6
  _____


            REVIEWERS

                  CHOP:    J3II, J3I3
                           J3I
                  COORD:   J6
                  CHOP:    J3
```

Fig. 11-1 Possible Chop Lists

11.7.1 Remarks on the Structure and Operation of the Chop List

Respondent: Usually, when you run a message, it doesn't get out of the division until the division chief has chopped it. Then it could go to a number of people for their comment or their information; these are people at the working level. I want to think about that for a little while because that is a capability we really don't have now. It's not very easy to do. Really, the piece of paper goes from one guy to another to another, serially, usually. And sometimes a lateral copy. But lateral copies don't always go from the same level in the chop chain. *It would be nice to be able to stick out here somewhere, J--, okay, he wants copies to go to whoever.*

Interviewer: We assumed that anyone on this list could further send it to anyone within their own organization -- build a sublist, if you will, using the same structure, indicating what they wanted to happen in parallel and what in serial. Would you use the parallel routing?

Respondent: Yes. Sometimes when you have a really hot item, the parallel routing really expedites it. It really does. So, I think you should have that capability.

Interviewer: And we should just be very careful about the nomenclature?

Respondent: Well, that's just my problem. Someone else maybe doesn't have that problem.

Interviewer: No. We've found that everyone has that problem, but everyone has a different set of words. Everyone understands chop, but with any other words we pick such as review or comment, there is no universal.

Respondent: I think he should get it for comment, concurrence, which is really chop, or for info.

Respondent: *If you do it in serial is there a way that you could control the timing such that if you were to send it first to J--- for a chop and what he said about your message was pertinent to what you wanted, it might, say, involve some changes you'd like to make before everyone saw it, could you step it in that fashion?*

Interviewer: The default condition we assumed was that if anyone made edits or comments, it would come back to the drafter before it went any further. Now, there are other kinds of overrides we envisioned like your example, after you've gotten it back, for some reason you want to temporarily skip over some of the chop list and go up here and then come back, that kind of thing, then rather than rewriting the chop list, when you press the SEND FOR CHOP button, you could type in an explicit office code or codes before EXECUTE. This would revamp the order of review.

11.8 INTERPRETATIONS AND RECOMMENDATIONS

We recommend maintaining a single version of the draft. This bookkeeping should be assumed by the service, unlike the operation of most TENEX subsystems where new versions are generally desirable. Reviewers need not be distinguished. The list should be labeled CHOP LIST. It is essential to allow the user to query the status of the draft. We recommend dimming the codes of those who have chopped as a concise representation of that status information. Alerts, as feedback, are desirable but not necessary. All respondents except two preferred that control of the draft reside with the drafter. We concur. The two alternate solutions (automatically changing the drafter, and the corelease) appeared earlier in the dialogue of this chapter. No one felt strongly about incorporating into the service the delegation of review authority. We agree that it isn't necessary. If it is provided, then the default routing should cause the draft to go back through the delegator, but a bypass option should be made available as a parameter. The circle chop, as brought up by the respondents, is essential. We proposed a mechanism for handling this within the chapter; it was endorsed by the respondents and it is recommended by us. Allied with the circle chop is the problem of chop by those with no terminal access. Again, we proposed a solution which we recommend. The structure and operation of the chop list was highlighted in this chapter. We refer the reader to the Washington report [Heafner 76] for further detail. We recommend this procedure and operation.

12. RECEPTION AND DISTRIBUTION FUNCTIONS

In a service automated from writer to reader, the reception and dissemination facilities are as important (if not more so) as those of preparation. Our earlier studies concentrated on the preparation phase and associated facilities, simply as a convenient starting point. Yet some aspects investigated earlier, such as message formatting, message retrieval, and the alert functions, impinge on the reader as well as the writer. So, despite its title, this chapter covers only a part of the reader operations addressed by the report. Here, we deal with misdirected messages, reclassification, and the assignment of action. The questions aren't numerically rated and therefore (as we have generally done throughout the report for nonnumerically rated questions) we include a moderate amount of dialogue in an attempt to faithfully convey the respondents' attitudes.

12.1 ACTION/COGNIZANCE ASSIGNMENT

12.1.1 A Question on Action Assignment

I'd like to ask some questions now concerning reception and distribution functions. When you receive an incoming message, you can further assign the action or cognizance to someone else within your organization. How do you do this now?

12.1.2 Analysis of Responses to Action Assignment

With this question, we had in mind the downward assignment within a chain of command, by an action officer to a subordinate. Apparently, this is not something that regularly occurs in J3, with the important exception of the DDO. Most of the dialogue then represents that of J3 Administration (the message distribution personnel). They answer the question in the context of their duties, which, as pointed out in Chapter 2, include the responsibility for the initial action assignment and distribution of an incoming message. *A need was identified by these gentlemen to automate the use of their distribution index, which is now a manual operation with a card catalog.* Let's examine the problem from their dialogue. Pay particular attention to the conversation with the third respondent.

12.1.3 Remarks on Action Assignment

Respondent: We do it by subject. J3 is broken down into directorates. Each one of them handles certain topics: aircraft, ships, nuclear weapons. Once you see the subject it is easy to determine who gets the action.

Interviewer: How do you do the action assignment?

Respondent: We stamp it ACTION and put it in his box; he comes by and picks it up about every two hours.

Interviewer: Would you prefer to have instructions to do it? You might send an action copy to some office code and information copies to others. So you need to differentiate between them.

Respondent: Yes.

Interviewer: Would it be sufficient to have buttons labeled ACTION, COG, and INFO? Then if you were going to send it to some particular office code, you would push the appropriate button and type in the office code. Then the distribution list would be updated to reflect this and the message would be routed to that office.

Respondent: Yes.

Respondent: We go by subject of the message. We have a card file by subject which shows who is action and who is info. If it is a subject we handle every day and we are familiar with it, then we automatically know where to assign it. But if it is not familiar, then we look on the card file. Or if it has a reference then we'll look up who had action on the previous message and send it to the same one. If they sold action on the old one, then the copy in our file will show that the action was changed.

Interviewer: Would it help you if the system could tell you who had action on the messages referenced?

Respondent: Yes it would, definitely.

Interviewer: How do you make the person aware that you have assigned action to him?

Respondent: We have an action/cog stamp that we stamp the top copy of their message.

Interviewer: What kind of instruction would you prefer to assign the action using this service? One thing we could do is to mimic your stamp. That is, you could have buttons labeled ACTION, COG, and INFO. Instead of stamping the message you would push the appropriate button and type in the destination office code and it would go to them.

Respondent: Yes, or we could say send it to so-and-so and then say action.

Respondent: *We have a card deck with 900 or 1000 different subjects, along with each office that handles that kind of subject. A message comes in. We assign some office as primary action on it, with a notation that action or cog is given to this office. We then furnish info copies to the rest of the divisions.*

Interviewer: Would it be useful to put your card deck on-line?

Respondent: *That's what I was thinking of. The computer could show you the distribution automatically and if you okay it then you press a button and it goes.*

Interviewer: *One way that could be automated is as follows. Your card deck, indexed by subject, is on-line. The message subject is compared with the card deck and when a match is found it then pulls out the distribution associated with that subject. This is presented for you to edit, to instruct the service to search further, or to send it out. Is this basically the way you want it to work?*

Respondent: Yes. That would be fine. *It should say this is the subject and this is the distribution.*

Interviewer: If you had to explicitly ask the service to perform this, what instruction would you use?

Respondent: Probably, RESEARCH ON-LINE SUBJECTS.

Interviewer: And then it presents the subject and distribution list. Now you want to say yes or no. You either have a button or type in something depending on how often you do this. What would you want to do?

Respondent: You do it on every action/cog message, so you probably want a button. It could say OK or DISTRIBUTION OK. You would want a DISTRIBUTION CHANGE button that would allow you to type in the changes that should be made with respect to that particular message.

Interviewer: This new feature that we've just described, can you give me a rating for it?

Respondent: *That would be highly desirable because that would eliminate typing out the distribution on every message and looking up every subject.*

Interviewer: Also, you might have the capability to directly edit the distribution as displayed, instead of needing a button for that.

Respondent: *You want two capabilities: One to edit the distribution for a particular message, and one to change the file.*

Interviewer: So you need instructions for creating the file, for updating it by editing it, adding new subjects.

Respondent: That would be super handy for us.

Interviewer: Okay. It is easy for me to offer you this because I'm not working on any of the three projects building these services. We're making recommendations to them based upon what you say. Understand that this isn't a very hard thing to implement, but there is an important question of time and priorities of the various features people recommend. But, if you have this feature, you're only creating the file once so it probably isn't important what that instruction looks like. However, you may update it periodically. What kind of instruction should we have to say "Show it to me?" How about just using the DISPLAY button and naming the file so that you just treat it sort of like a message file?

Respondent: That's fine. It could be done by subject references, just a subject file. The only time we would look at it would be when someone says "I don't want to see any more messages on this subject." *Then we would call up that subject, delete them, and maybe make a private comment* saying they wanted to be deleted.

Interviewer: This file wouldn't be simply a text file. There is structure because, for example, the service is comparing the message subject to the subject entries. We have to differentiate one entry from another and the subject from the distribution list, and within the distribution list.

Respondent: *I think it would be best to give the subject and then indent it for the distribution where the first one is for action/cog and then list who gets information copies.*

Respondent: The DDO can change the action agency or he can open it up to other agencies. He does that by using an open-up form.

Respondent: For J4 messages of immediate or flash that arrive after hours, we call them from the command center. *If it is immediate or flash, right down at the bottom is says "notified at".* We enter who we call and the time.

Interviewer: Is that field printed on the message?

Respondent: That comes out on every immediate and flash message.

Interviewer: Just on immediate and flash?

Respondent: Right.

Respondent: I put a stamp on it -- A, I, or Z for action, info or cog.

Interviewer: Would you prefer to enter the letter along side their code, or would you prefer an explicit instruction?

Respondent: I think there ought to be a tableau you could fill in. ... We don't want to get hung up on whether it was an action or an info message in the first place. *Just because we put an A on the message doesn't necessarily mean we own the action.* Maybe we are going to take action on it which is related.

Interviewer: You're saying that you can receive an info message that you'll assign action on?

Respondent: Yes.

12.2 BUYING AND SELLING ACTION ON A MESSAGE

12.2.1 Question on Informal Agreements

I have a question about buying and selling action on the message. You've gotten a message for action that doesn't belong to you. My understanding of the procedure is that by telephone you informally agree with the buyer on the transfer of action on the message. Then someone on your side fills out a form, sends it back to the comm center and then the message is reissued and the action is assigned to the other party. Now we can do this electronically. What we'd like to do is, again, have you informally agree to the buy/sell action rather than having this as formal protocol in the service, and then just have you issue an instruction to change the action to some other office code. If that's acceptable, then what we'd like to know is how would you instruct the service. What kind of button or name would you like to indicate that you're transferring the action on this message?

12.2.2 Analysis of Responses to Action Transfer

Our question to the first few respondents was, "How do you buy and sell the action?" The question was refined throughout the interviews to the form given above. We state this here, because some of the responses (from the early interviews) seem to restate the above question, but they were really answering the earlier form of the question.

In any event, the consensus was that reaching the buy/sell agreement is done informally (only two wanted it to be formal) and could remain so. The users would like a button labeled REASSIGN ACTION or SELL which would have the effect of completing a transfer of action form and resubmitting to the comm center. All respondents answering the question wanted the service to handle the transfer of action and reissue the message.

12.2.3 Remarks on Action Transfer

Respondent: We just coordinate with them: go down and see them or call them on the phone to let them know that it is their message and not J3's.

Interviewer: So you do that informally?

Respondent: Yes.

Interviewer: I understand that after an agreement is reached a form is then completed to officially indicate the transfer of action.

Respondent: Yes, you type "action change J3 to J6."

Interviewer: So, one way you could do that is to press a button labeled ACTION CHANGE and type the office code of the redirection.

Respondent: Action change. One week you might not get any and the next week you might get ten of them. But it is really something you have to have. It might average four or five a day.

Respondent: *An action officer in J3 will call an action officer in J5 and tell him the date-time group and the subject, and he will open up a copy. If the J5 determines that they should get it, the J3- will make out a change sheet saying "action from J3 to J5."*

Respondent: *The problem is that not everyone will be on the system. And most of the ones we deal with are outside J3. What we were hoping to do was to get a copy on the screen of the sell sheet, the way it appears downstairs. There is one for internal and one for external. It would be nice to punch up all the information on the sheet and then have the computer send it back downstairs.*

Interviewer: To LDMX, you mean?

Respondent: Yes.

Interviewer: *Okay, so we need an instruction to call up the sell sheet. We have a button labeled draft which you then type in the name of the form you want, such as a DD-173 or some pro forma form.* You could use this and type in the form number or name of the sell sheet. Or you could have an entirely different instruction such as SELL.

Respondent: *That would be very good to use DRAFT and type the name. That would give us access to all the forms we need without using up buttons.*

Interviewer: *MITRE published copies of the buy/sell forms recently. If I copy those will that be okay?*

Respondent: *Not really. There have been some changes. We haven't even updated the changes ourselves, because we've just reorganized half of the division.*

Respondent: I just send it back down to the admin section and tell them it is not for me and who I think it should be for.

Interviewer: How do you know who it should be for?

Respondent: From experience.

Interviewer: Do you mark on the message to indicate who it should be for?

Respondent: Yes. I just say "action should be with" whoever I think it should be with. Right now I usually call them on the phone.

Interviewer: If you had a button on the keyboard whose intent was to send

the message back to be rerouted for action to another office, what would you label that button? After pushing the button, you would type in the office code of where you wanted it to go.

Respondent: REASSIGN ACTION.

Respondent: Usually the assignment of this is done by a clerk who uses "buzz words," some sort of a key and so on, and you can't tie down an entire division to a responsible action just because a clerk made what he thought was a good judgment but it turned out to be faulty, or the buying agency's reluctance to do their job.

Interviewer: But the informal phone call you use now is sufficient? You wouldn't need any instructions in the service for negotiating that settlement?

Respondent: No. Then I fill out a form and resubmit the message into the distribution system with the adjustment in action.

Interviewer: If we provide that form on-line ...

Respondent: That's right. *You call up the form and fill it in and the system should resubmit within the system and redesignate the action agency, with the proper open-up or cognizance of other agencies.*

Interviewer: You're going to indicate the open-ups as you're reassigning?

Respondent: Yes.

Respondent: *You could put something in your machine analogous to the piece of paper that is used now. There is a form and it is fine. It simply names the two parties to the transaction. And at the same time that you do that you can also do open-ups. Because lots of times I'll buy a message that was misrouted and ask them to also open J--, so that's two things done at the same time.*

Respondent: That's a very important function. *I was thinking of a more positive method of the individual who's going to buy the message inserting his approval into the system.*

Interviewer: We can do that. We'd like not to.

Respondent: He has to look at the message. I think that's important. If someone calls and says "I've got a message about nuclear reactors in Viet Nam", and I say "We're nuclear reactors down here, but I'm not sure we're nuclear reactors in Viet Nam, we never had anything to do with nuclear

reactors in Viet Nam, maybe we are." But the thing is, *before I accept that, I'm going to see that message.*

Interviewer: When you're talking on the phone, he can certainly open you on the message and now you have a copy to examine.

Respondent: *But then after you've seen it, the guy ought to have the capability of inputting his acceptance of the action/cog.*

Interviewer: How would he do that? I'm looking for vocabulary. How would you say to the system that you want to accept this message that you're looking at?

Respondent: ACCEPT ACTION.

Interviewer: On the seller's part, would he have to say anything?

Respondent: Yes. CHANGE ACTION TO so-and-so.

12.3 DELEGATING ACTION AUTHORITY AND TERMINAL GUARDING

12.3.1 Questions on Delegating Action Authority and Terminal Guarding

In delegating authority for someone to act in your behalf, should the service be told by explicit instruction, by your entering a name in an access list, or by the delegatee entering your temporary password?

.
.
.

What features should the service provide for guarding when you are away from your terminal for an extended time period, such as days or weeks? Should the incoming traffic be rerouted to a person or office code, or to a terminal?

12.3.2 Analysis of Responses to Delegating Action Authority

Several questions such as the above were asked. In general, the respondents felt that such features were not needed, beyond those requested and discussed in Chapter 10 concerning unattended alerts.

12.3.3 Remarks on Delegating Action Authority and Terminal Guarding

Respondent: That doesn't happen. I'm never gone more than 10 or 15 minutes. It's very unlikely that anyone would be gone for more than an hour. Just repeat the notice every 5 or 10 minutes.

Respondent: It's not needed because there will always be someone around to get it. After say, 1600 in the afternoon until midnight there won't be anyone on our terminal. The DDO or somebody in that area will get it.

Respondent: It's not needed. In J3 we have three people: one for night, one for morning, and one for afternoon. They are all doing basically the same thing. So we would all be identified by the same office code.

Respondent: It's always addressed as org code. Very seldom do we get a message addressed to a person. There will always be someone in the office who can act for the office code.

Respondent: No. There would always be someone there. Someone would always take the place of that office code.

Respondent: No. Our desk is manned 24 hours a day. I'm one of five officers who man that desk. So someone will be there.

Interviewer: So the incoming traffic is addressed to that desk?

Respondent: That's right.

Respondent: For GENSER staff it is all by function, the organizational function, regardless of who the people are. If you're going to expand this later on to SI and compartmented, where there are only certain individuals and they are usually named in the message, who can see it by name ...

Respondent: Traffic comes in by office code, so this is not a problem.

Respondent: Right now we have a system where the other section chief over there where I am now does it.

Interviewer: How is he identified differently from you?

Respondent: I would do it by code. How do I do it? The day I leave do I type in "send all my files to J--?" All incoming traffic.

Interviewer: I want to know exactly what is necessary. What is a good instruction name for that?

Respondent: Basically, what I would want to say is "route all incoming messages to J---."

Interviewer: So, the keyword here is "route" and then you would type in his office code?

Respondent: Yes.

Interviewer: And that would remain in effect until you came back and said route to your office code?

Respondent: Yes, or delete that instruction, or whatever.

12.4 MESSAGE RECLASSIFICATION

12.4.1 A Question on Message Reclassification

A different kind of question: downgrading and declassification. Let's assume in the declassification field you enter GDS or ADS. At some point in time we know that we have to change the classification on the message so we pull up the master copy from archive and make the appropriate changes in the classification. One thing we could do following that is to look at the distribution list, send a notice to all those people on the distribution list saying this message has been reclassified, or we could only change the classification on the master copy. We certainly can't affect hardcopy files people may have. Is it necessary for us to send a notice to the distribution list telling them that the message has been reclassified?

12.4.2 Analysis of Responses to Message Reclassification

In response specifically to the above question, exactly half of the subjects stated that notification should be sent. One respondent suggested a compromise solution whereby users would be periodically notified of downgraded messages of which they had received a copy.

Independent of *declassification*, it was brought to our attention that we were overlooking a very necessary requirement in terms of *reclassification*. In this instance, a message is issued with an incorrect classification. Later, a second message is issued stating the correction. The service should provide for correcting the classification of the original message.

12.4.3 Remarks on Message Reclassification

Respondent: We're instructed to put that on. When it's downgraded, you should send a notice to the people who received it.

Respondent: What you would really have to do is to send out another action message to all recipients.

Interviewer: And we would also have to change the classification fields of the archived copy of the message.

Respondent: That's right.

Interviewer: Now, none of this will probably happen in this test next year, but I ask the question because we're also interested in features of a later operational system.

Respondent: The only thing that would happen within a year, probably, would be change in classification, say, from Confidential to Secret.

Interviewer: Is that something that you would explicitly do?

Respondent: That's right.

Interviewer: Who has authority to do that?

Respondent: First of all, there are instructions as to what the original classification should be. The originator does that. So, the originator or originating office has to change it.

Interviewer: According to NTP-3, each paragraph has a classification. He can change or upgrade the classification of a single paragraph as well as the whole message?

Respondent: Yes. That's right.

Respondent: But don't tell everybody that ever received that message that it has been downgraded. Again, that's an unnecessary feature.

Respondent: I think the system should have a very simple format for readjustment of downgrading and upgrading the reclassification.

Interviewer: What should we do as a result of your typing instructions into that field?

Respondent: There is not much you can do.

Interviewer: Well, a couple of things. One is that we can change the classification fields of the message in the master archive.

Respondent: You must go to the positions, to the action, the info. It has to be changed.

Interviewer: People may have made hardcopies. I can't change those. But I can inform them.

Respondent: Yes.

Interviewer: Then it is sufficient to send a notice to the distribution list saying that it has been downgraded?

Respondent: Or that you blew it, it should have been secret instead of confidential.

Respondent: Except for ADS, I think that is something better left alone.

Respondent: By the book you should send notification.

Respondent: I think you'd have to notify them. You might also want to remind them that they have a hardcopy.

Interviewer: Well, we could know who made hardcopies through the system, but we certainly wouldn't want to. Also, someone could copy a printed copy using facilities outside the service. We have no control over that.

Respondent: Yes. That's true. *You might periodically give him a list of messages that have been downgraded.*

Respondent: I would think that we'd have to let them know some way. Could we look at it from two different angles? One being a mistake when the message was sent out and you want to clarify that. And that I would think would apply not just to classification mistakes but any mistakes in content.

Interviewer: You want to cancel or recall? We haven't talked at all about cancellation or recall.

Respondent: It's done pretty frequently. Quite often when you get a busy period and something goes out that isn't complete or is misdirected, then you have to send a follow-up message correcting what has happened. For a longer period, as the time critically wears off, the need for the follow-up notification is less and less.

12.5 INTERPRETATIONS AND RECOMMENDATIONS

The administration functions associated with action assignment were introduced in Chapter 2. In this chapter these enlisted personnel responsible for message distribution relate their use of the card index file in action assignment. Together we develop proposed automated aids to facilitate their job performance. Although it is not absolutely essential to put their card index file on-line, its use is integral to their primary function. Therefore, we recommend the on-line subject/distribution file with the supportive features developed in the beginning of this chapter.

Instructions for the action/cognizance assignment to subordinates is not needed. To the extent this is used it can be handled through annotation.

We recommend that the buy/sell negotiation be conducted informally. An instruction to transfer the action is desirable. However, this requires supporting software in LDMX as well as in the test service system. This may not be feasible; thus it may not be possible for on-line action transfers to persons not using the test service. Yet, the paper work necessary for the comm center can be done on-line in any event. If this is pursued by the designers, then note that the buy/sell forms have recently been changed.

With respect to delegation of authority and terminal guarding, those features proposed in Chapter 10 for rerouting are sufficient for GENSER traffic.

The ability to reclassify a message, under explicit instruction from the originator, is needed. This, for the purpose of correcting mistakes. Our understanding is that the general downgrading problem will not be addressed by the test service.

13. COMPLEMENTARY COMMUNICATIONS METHODS

In previous chapters, it has been brought out by numerous respondents that a large part of their activities involve formal correspondence other than message traffic; in some cases up to 70% of their time is devoted to nonmessage correspondence. From the Washington study [Heafner 76] it was learned that in times past the use of *pony links* or *wire notes* was found to be useful for a broad range of informal correspondence, but was eliminated because of their lack of formality and accountability. But what of the electronic assistance for more local and restricted informal correspondence?

The nucleus of the communications services thus far proposed could be readily adapted to encompass complementary forms such as formal memorandums and informal notes. In addition, interactive person-to-person dialogue (for perhaps, purposes of discussing a message) could be supported by directly (logically) linking terminals. Such is the substance of this chapter.

13.1 IN-HOUSE RECORD COMMUNICATIONS

13.1.1 A Question on Formal Intraorganization Correspondence

I'd like to ask a couple of questions now about using the service for forms of information other than record messages. One of the forms of communication that we could provide (using essentially the same sorts of facilities we've talked about: the file organization, the alerting mechanism, notifications and so forth) is an in-house formal record communications: memorandums or perhaps some standard forms, or whatever would be applicable. There would be accountability in the sense that correspondence would be archived. How would you rate such a facility?

13.1.2 Analysis of Responses to In-house Communications

This feature was rated desirable with the most common reply being highly desirable, see Fig. 13-1. The most frequently identified uses were for intraoffice memorandums and interagency memorandums within the CINCPAC Headquarters.

13.1.3 Remarks on In-house Communications

Respondent: I think that would be highly desirable within a close organization that's manned 24 hours like the command center.

Interviewer: What kinds of things would you use it for in the command center?

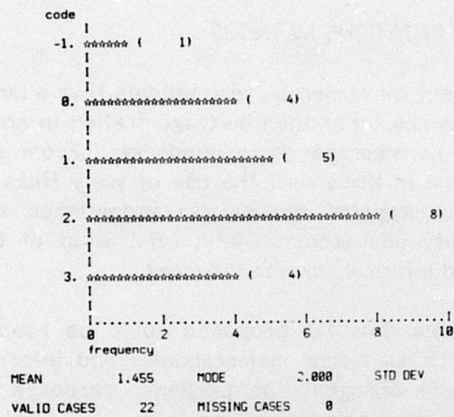Respondent: Status of actions, informal notes.

```
code
 I
-1. ****** (    1)
 I
 I
 0. ******************* (    4)
 I
 I
 1. ********************* (    5)
 I
 I
 2. ************************************* (    8)
 I
 I
 3. ******************* (    4)
 I
 I..........I.........I.........I.........I.........I
 0        2        4        6        8       10
 frequency
```

MEAN   1.455   MODE   2.000   STD DEV   1.143
VALID CASES   22   MISSING CASES   0

Fig. 13-1 Ratings for In-House Record Communications

```
code
 I
 0. *********** (    2)
 I
 I
 1. ****************************************************** (   10)
 I
 I
 2. ************************************ (    7)
 I
 3. *********** (    2)
 I
 I..........I.........I.........I.........I.........I
 0        2        4        6        8       10
 frequency
```

MEAN   1.429   MODE   1.000   STD DEV   0.811
VALID CASES   21   MISSING CASES   1
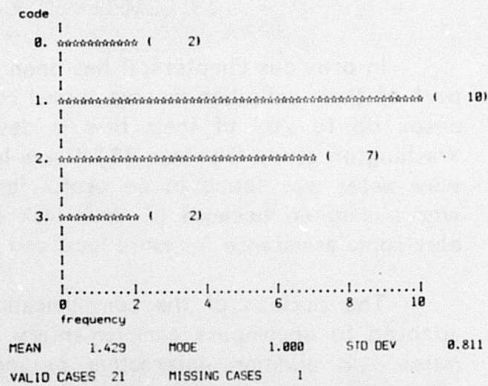
Fig. 13-2 Ratings for Informal Message Service

```
code
 I
-1. ****** (    1)
 I
 I
 1. ********************* (    4)
 I
 I
 2. ************************************************** (   10)
 I
 I
 3. *********** (    2)
 I
 I
 I
 I..........I.........I.........I.........I.........I
 0        2        4        6        8       10
 frequency
```

MEAN   1.706   MODE   2.000   STD DEV   0.920
VALID CASES   17   MISSING CASES   5

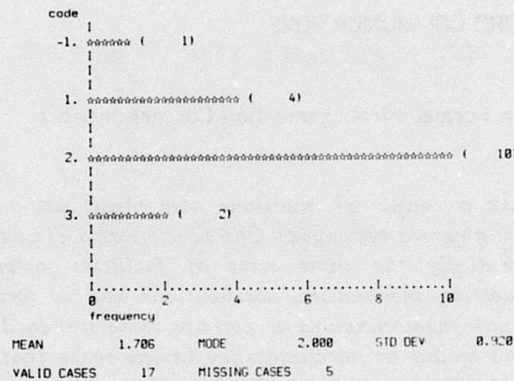Fig. 13-3 Ratings for Terminal Linking Facility

Respondent: It is just as important as the other (formal record traffic).

Respondent: We would use it for formatted point papers, WEB (Weekly Executive Brief), background papers and progress reports which are mostly free forms.

Respondent: Oh yes. I'm up to 600 memos already this year.

13.2 INFORMAL MESSAGES

13.2.1 A Question on Non-Record Communications

Now, there are a couple of other forms of communication that we could provide. One is a totally informal message service with the same sort of features that we've talked about, except for archival. No recording, no accountability. This is something akin to a phone conversation, perhaps, where you want to discuss the content of a message. It has the following features. It's secure whereas most of your phones are not. It allows you to leave a message in someone's "in box" when they are not in their office. It's "off-the-record" as a phone conversation would be. How would you rate the utility of that feature?

13.2.2 Analysis of Responses to Non-Record Communications

Informal messages would be useful; see Fig. 13-2. Those respondents who asked about the range of recipients of informal messages felt that its use should be restricted to within the Headquarters.

13.2.3 Remarks on Non-Record Communications

Respondent: That is almost a necessity. That would be very handy for lots of people.

Respondent: The informal is what we need in the command center.

Respondent: It is highly desirable. My rationale is that you may want to say "What is the status of -----. It is getting close to my suspense date, are you going to make it tomorrow?" You're thinking about intraoffice messages?

Interviewer: Not with the informal. Earlier I thought so, but I'm told it could go anywhere.

Respondent: Not a message out of the Headquarters. You're thinking of an informal out of the Headquarters? You don't get informal out of the Headquarters. Out of the Headquarters is a formal communication.

13.3 DIRECT TERMINAL LINKING

13.3.1 A Question on User-User Network Communications

How about direct terminal-to-terminal linking? Now you are interacting in real-time and what you type appears on my screen, and vice versa, so that we each have displayed the dialogue of our "conversation." That is different from leaving a note in someone's "in box." Both of them are informal with no record keeping, unless you want to get a hardcopy. The service will not archive the transcript. Both are secure. How would you rate the direct linking facility?

13.3.2 Analysis of Responses to Direct Communications

Linking was rated useful, with the most common reply being highly desirable; see Fig. 13-3. There was a significant difference between the administration personnel (acceptable rating) and the other subgroups (highly desirable rating). Several subjects asked for an on-line conferencing capability.

13.3.3 Remarks on Direct Communications

Respondent: You may have a guy drafting a message and he may want a quick input from someone and he could ask directly.

Respondent: That would be used in crisis situations. For example, during Mayaguez there were communications going around the room between various high-ranking individuals, including even inbound from the Secretary of State. They didn't want everyone else privy to that information. They want to be able to selectively screen who is going to hear this information. Also, I could see a use for this kind of communication, for example, where I am working at my terminal and my boss is too, and something comes in and he wants to interrupt me and say "Come over here" or "Do something." That could be used.

Respondent: That would really be great, because occasionally we can't get people on a secure phone. Every day I talk with my counterpart at PACFLT. At 4:30 in the morning he calls me on a secure phone to make sure that he is briefing the Admiral down there exactly the same as we're briefing up here. It's just to cross check.

Respondent: I could save myself all sorts of "foot-leather" because I don't

have secure communications within the Headquarters. Well, I do, but it's difficult. I have access but most people do not, particularly action officers. If we had a secure display, that would be a plus three. Notice I haven't rated things very extremely.

Respondent: A lot of people don't have secure phones, or if they do have them, they are not conveniently located. So, that's a deficiency that it would correct.

Respondent: It's highly desirable. I don't know if it is absolutely necessary.

Respondent: The idea of having a secure facility I think is good. ... I think this is going to be great. I can envision it's use from an action officer's standpoint. I can also envision it from a receiver's standpoint, whereby you could get a lot more down from higher Headquarters with this readily available. So, it's going to work both ways. I think it's going to be a good thing. When the CINC wants something done, instead of going through a chain, it's going to allow the people in the higher-up positions to get down to the lower positions.

Respondent: A conversational mode would be very desirable.

13.4 UNSOLICITED REMARKS ON NONMESSAGE CORRESPONDENCE AND DOCUMENTATION

Respondent: Are we going to be able to record nonmessage traffic in these files?

Interviewer: We give you many ways to enter annotation. Some people have indicated special forms that should be included.

Respondent: Like a memo for record. Would it be possible to put a memo for record in a subject file?

Interviewer: Sure. At the least you could enter it as annotation to the file, according to what we are proposing.

Respondent: I think it would be desirable to have a memo for record form that could be put into all of these files to record verbal conversations.

Respondent: I want to be able to send it to someone through someone. But the "through" has the prerogative of stopping it right there and readjusting it and sending it back.

Interviewer: We could use essentially the same facilities as for formal record traffic.

Respondent: Yes. The system should be capable of doing that. But it is a different format. It's a structured format. And you have other formats: point papers, talking papers, position papers, often small three-by-five cards that are carried to briefings. ... A *talking paper* is much the same thing, only in much more prose. A *position paper* is a full descriptive format, it's a position. You may also get into *letters* -- formal communicative letters -- not messages but letters that may be addressed higher or lower in the J3 Headquarters. But all of these have essentially the same format. We primarily do our work with messages and memorandums. However, there is a significant amount of letters, explaining a position -- they may be mailed or hand-carried. Now, when the other services input to the joint arena, they are uniservices coming to the joint arena and they use their own specific style of communicative effort -- primarily it's letters. But they may also include, for example, in the Army's terms, *disposition forms* which is a very specific Army informal method of correspondence. Now, the Navy has *Fleet SITRAMS*, I don't know what the Air Force has.

Respondent: There are a number of documents that we use, that are JCS documents, DIA appraisals, reports, things of this nature -- things other than messages, which I presume want to be in the system. Sometimes very thick documents.

Interviewer: Only that information that you put in yourself...

Respondent: It's nice to have that kind of stuff available to you via the system. But if I've got to type it all out, no.

Interviewer: Once such a system is widespread, then when such a document is created, it can be created on-line.

Respondent: It would be great if I had, for example, certain documents that are limited in distribution, JCS documents. A good example is Joint Strategic Capability Command which I use all the time in my reviews of joint operations procedures and things of this nature. It's useful for me to be able to call that up in a hurry; otherwise I've got to go find the document. I've either got to go to the vaults or go to another directorate and borrow his if he'll let me have it. It would be *extremely* useful beyond the test, and into the future, if this sort of thing can also be placed into the system supplementing, if not in many cases replacing, the vault-carrying requirement. Now that can be as restrictive as the vault people want it to be. They can also assign the restriction of being able to call it up to video receivers, but there are certain advantages to that. I wouldn't have to run all over Headquarters to find that document.

If I've got a document that I've sent out for staffing, but I need it then I have to spend several hours or take one of my yeomen and have them try to find it. It would be extremely useful to be able to call up a copy, go to that page number and I have my material. It's not historical, it is current information.

So, there are some of the things that could be looked at. It's all part of preparing messages.

Interviewer: In addition to the filing and retrieving, you may want formatting capabilities. There are some very nice document preparation facilities that produce excellent looking documents compared to what you would get doing it with a typewriter.

Respondent: My files are not strictly messages. It's survey reports, inputs also by mail, memos. What is the advantage of having all this information at hand here and then having all the messages in another area?

Interviewer: It's a step in the right direction, in getting all that information on-line where you can access it easily. In the beginning you have your messages.

Respondent: If I want some memos from J-- then it all "goes by the tubes."

Interviewer: We'll talk about memos a little later on, because perhaps we can offer essentially the same sort of facilities for intraoffice memos as for the DD-173. But large documents which already exist won't be there.

Respondent: When I open a folder, I've got everything I want. It's there. This system, to me, is useless because it's not there, it's not in my folder in my office. I've got to go to that tube. Right?

Interviewer: If you want to continue operating the way you now do, then you can automatically hardcopy everything that comes in to you, and file it away the same way you do today. That's one option.

Respondent: What if you normally put in your file not just messages but memos, notes, things of that nature? I just had a project where I had to ask for comment from not only external agencies where messages were involved, but internal agencies where memos were involved. And perhaps I had six responses from within the staff and three messages external. Is there some way that I could enter the memos into the file in addition to the messages?

13.5 POINTING DEVICES VERSUS FUNCTION KEYS

13.5.1 A Question on Preferences of Input Mode

Pointing devices such as the light pen were described, along with menu-like interaction. Subjects were asked if they preferred this style of interaction to the keyboard/function keys that we had been working with.

13.5.2 Analysis of Responses to Input Mode Preferences

Respondents slightly favored keyboard/function keys, although most subjects had no strong preference.

13.5.3 Remarks on Input Mode Preferences

Respondent: Either would be outstanding compared to the way things are done now.

Respondent: I would prefer to push the buttons.

13.6 INTERPRETATIONS AND RECOMMENDATIONS

The formal message is but one of many communication forms used by J3 Operations. We strongly believe, as do the persons we interviewed, that the utility of an automated communications system is directly related to the number and kinds of these forms supported. Therefore, we *strongly recommend* the following three capabilities. The first is formal correspondence within CINCPAC Headquarters. A minimum useful capability is either a free form or a *pro forma*, where all formal message features apply with respect to filing, alerting, draft review, and so forth. The second is the informal free-form, stand-alone note. Since this is informal, there should be a guarantee that informal notes are never archived. Beyond the archive, the filing and alerting and other mechanisms pertain. The third is the direct linking. "Militarized" syntax and vocabulary for the instructions is preferred, yet as a minimum, we would endorse the TENEX link operations as presently implemented. We feel that offering these three capabilities will greatly enhance the acceptance and usefulness of the automated service.

14. MILITARY-PROPOSED FEATURES AND EXPRESSIONS OF CONCERN

At the close of each interview, the subject was asked to supply any additional remarks that he or she felt were relevant to either the 1977 test service or to a later operational service. The ensuing dialogues led to a potpourri of needed facilities in the context of both the experimental service and an operational system. In this chapter, we highlight some of those features most germane to the 1977 test service, although some of them apply as well to an operational environment. Chapter 15 deals exclusively with a future operational system.

These individuals also unveiled many potential (with respect to the 1977 test service) and existing (with respect to LDMX) problems with which they were concerned. Some of the dialogues follow, in no particular order.

14.1 LACK OF UNIQUENESS OF DATE-TIME GROUP

Respondent: Someone may come in and call for a message from JCS with a date-time group. It has happened in the past that we have had two or three messages from JCS with the same date-time group.

Interviewer: The DTG and PLA of originator is not unique. What do you do in a case like this?

Respondent: We send them a copy of each one and let them pick out the one they want. ... We had a message the other day with two date-time groups. The one at the top and the one and the bottom were different. The Admiral requested it by the top one. We didn't have it filed by that one and the comm center said they had no record of it. We finally found a "bootleg" copy and discovered the problem.

Interviewer: In the service we're talking about, it is generated only once and then electronically copied if it needs to appear in different places. So, that won't happen.

14.2 SATURATION OF EQUIPMENT

Respondent: We're only getting one terminal and one printer. I'm concerned with having people stand around looking over my shoulder in the morning to read their messages. I would manipulate the buttons and they would stand around and read.

Interviewer: If you're only getting one terminal for the office, then I would suggest that you get hardcopies for your bosses and let them work in the same way they do today. Or you could use the terminal at different times.

Respondent: But it would help me.

14.3 SATURATION WITH RESPECT TO THE COMMUNITY

Respondent: From my vantage point, for it to receive enthusiastic acceptance, it should be functioning in the entire Headquarters. Because, as I see the biggest advantage of the system, it is as an internal coordinating mechanism in the Headquarters. And it would be most desirable for me, for instance, to go to J5 or to another agency outside J3. From the standpoint of time and reaction it is much better.

Interviewer: In an operational system, of course, you would have saturation. But, unfortunately for this test next year that won't be the case. I think it is mainly a question of dollars. You have the problem of not reaching a threshold of use.

Respondent: I understand the constraints you're working under. You're going to get mixed emotions from a lot of people because they can't do their work. You're going to have to have a dual capability during this test. No question about it. We work a lot outside our immediate area. It isn't like just running around Headquarters.

Interviewer: Perhaps then, where you can't reach all those people, its greatest asset will be the personal filing operations.

14.4 BANDWIDTH AND BAUD RATE

Respondent: I was thinking about this last night. I thought you could never perfect something where I can go through a stack of 150 messages as fast as I can now. Now, the more that I think about it, since I've already sorted the immediates and flashes ...

Interviewer: The pigeonholing and categorizing and the highlighting we spoke of should facilitate that somewhat. However, for scanning, paper is hard to beat.

Respondent: I'm concerned about the display rate. I scan through a stack of messages and pull out the ones I want to keep. Can I see them as fast as I can press the button?

Interviewer: One thing you can do to effectively increase the baud rate is to look at them in excerpt form so that you are only extracting the information you really look at anyway. So, you get a page that contains that information about lots of messages at once. When you press the button to page, you are looking at 20 of them instead of one. And for those of interest, where you want to see the entire message, then you have a different button to display that message. But we won't be able to show you the messages in their entirety as fast as you flip those pages. It's more on the order of a couple of seconds.

14.5 TYPING SKILLS

Respondent: The user is going to have to be able to type at the terminal.

Interviewer: Action officers or their aids certainly will because they compose and enter text. Those people receiving messages will presumably do mostly button pushing, and a minimum of typing, and in fact would not be a typist. It depends upon your job function. Those who would type would already have been trained in typing.

14.6 SYSTEM FAILURE AND BACKUP ALTERNATIVES

Respondent: You're going to be building the system from off-the-shelf components and we're going to be working with it. With its disablement, where do we go, and how do we get hardcopy of data we've filed in the files which are inoperable?

Interviewer: Presumably, you'll have in parallel the system you now have, LDMX.

Respondent: Is that a good presumption?

Interviewer: Yes. At least during the extent of this test.

Respondent: That's okay as long as I'm assured that I can do my job if it "blows a fuse," if a cable breaks, or a subsystem malfunctions.

Interviewer: Now. That's true of the formal record traffic. However, if you put a lot of informal correspondence ...

Respondent: That can be extremely important when your boss is wanting something.

Interviewer: Then I would suggest that during this one-year test, you also hardcopy it.

Respondent: It's redundant, and a very expensive proposition. It's just something I'm bringing up and something we've got to be aware of and should be addressed.

Interviewer: The point is, you have to get your job done and, at the same time, there is a need to test the service.

14.7 OFFICE CODES AS GLOBAL PARAMETERS

Respondent: Names change and codes change. This happens all the time in an

organization this large. So, I guess there is going to be a way to change everything that is in the entire system? Let's say they change J314 tomorrow to be J315. And everything in the system that had an access for 314 will have to be changed to 315. That can be done?

Interviewer: That's something we'll now think about. No one has raised that issue before. How often does that occur?

Respondent: We have some kind of organizational change once every month or two that would involve this kind of change. And of course you have people coming and going.

Interviewer: The problem of people coming and going we're familiar with. We assume that generally people will enter office codes because they are a little more permanent.

Respondent: I would think so.

14.8 LOCATING THE SUBJECT LINE OF THE MESSAGE

Respondent: The subject string. Does it differentiate between that and the "pass to" lines? Or is it simply the first line after the classification?

Interviewer: I'm not sure what you mean by "pass to" line.

Respondent: Back here. This one (Fig. 1-3). That's the classification line. (That ought to be UNCLAS instead of UNCLASSIFIED.) And then you have a subject as the next line, but that is not necessarily true. There would very frequently be a pass line here which you couldn't really tell from a subject line. It would say "Fifth Air Force for DOC, PACFLT for DCOXK," and so on, things like that.

Interviewer: And what is the purpose of it?

Respondent: Mainly in the Air Force, it tells the comm center who in that command should get the message. And by looking at that you would have no idea what the subject was. This could run as many as three or four lines.

Interviewer: Why does that not appear in the distribution?

Respondent: Because you send a message to a command. And if you know who in the command should get it, then you put that in your "pass to" line. Otherwise, it probably doesn't get to the right guy. The person in the comm center probably doesn't understand that it needs to go to someone in particular. ... Characteristic of that line will be the word FOR.

14.9 MESSAGE READDRESSALS

Respondent: What about getting readdressals?

Interviewer: The readdressal is a separate message. You would receive both the readdressal message and the message to which it referred.

Respondent: On this page (display of excerpts) you should indicate that it is a readdressal. Some people have a hard time with this. They call down wanting a message but they give us the date-time group of the readdressal message instead of the original date-time.

Interviewer: We could perhaps issue both. In filling out a readdressal, since the distribution information is the same, the service could automatically fill out most of it, all you would have to supply would be the PLA of the new recipient.

14.10 ADDRESSING PRINTERS

Respondent: For our purposes, we want everything printed on our printer. And if we want it printed somewhere else, we say that.

14.11 TRAINING

Respondent: We're also going to need some damn good instructors to come out and show the people what it is and what it does.

14.12 TERMINAL USE SEEN AS DEGRADING

Respondent: I think in a sense, there are a great many people who would feel in a way that it might be degrading to be expected to sit down and compose at a keyboard, whereas, they have no compunction about using a piece of wood to scratch on paper.

Interviewer: We don't look at it as making everyone a clerk. We figure you'd be doing the same functions as before and we're trying to give you more information in better form, and more timely. Do you get that impression or are we missing the mark?

Respondent: It is a pretty wide mark. I think that ideally a lot of these things have to be brought together. There is a tremendous advance being made in the word processing area, which relieves the originator of both writing and typing chores. It seems to expedite the flow of information. The clerks seem to accept it. And I think the final product is something better. If there is

some way to link that with what you have accomplished here in automated message handling, I think that would be ideal.

Interviewer: We haven't talked about the kinds of editing facilities that can be provided. We are certainly familiar with the commercial word processing systems and much of that will be incorporated in the test next year, along with other symbol manipulation, so that it should be easier for the guy entering text than the OCR is for him now.

14.13 ERROR PREVENTION

Respondent: There ought to be some means of error checking of messages so that if you have a secret message then the GDS has to say 84. That is a common error. There are a lot of "busts" on that. And there ought to be some way of encouraging people to use ADS.

Also, there ought to be some check to insure that you have no paragraph that is classified higher than the classification of the message. And if someone changes a paragraph along the line that changes the classification then the message classification has to change, the GDS has to change. I think that ought to be automatic. The paragraph marking is standardized.

Respondent: There should be something in the system to prevent people from deleting files by accident. You should have to type out DELETE and the system should come back and ask you if you are sure you want to do this, so that you have to go through two or three steps before you can delete a file.

Interviewer: That concept should extend to all delete operations such as a message or a draft.

Respondent: The system ought to make sure you haven't misnumbered the paragraphs. Frequently, people leave out a paragraph or paragraph number.

Interviewer: What are the consequences of doing that?

Respondent: On the other end, you don't know if you've got the whole message. Maybe a page fell on the floor.

14.14 FIELD INTERPRETATION

Respondent: The thing I mentioned earlier in the citation of references, I really think you need to have some way of looking at the command title and then being able to scan past other information and then come up with the

date-time group. Because, lots of times people will send a message from, for example, CINCPACAF, HICKAM, AFB, HI/DO and somebody might cite that simply as CINCPACAF DO something or other. So, you want to read right past that until you get to the numbers. It is a major problem with LDMX right now. That is why so much manual intervention has to take place.

Interviewer: What you described is a simple enough algorithm. Is that sufficient?

Respondent: Yes. I don't know why LDMX doesn't do that now. Unless it is letter perfect, like it appears in the Message Address Directory, then the system doesn't recognize it.

14.15 UPDATING DISTRIBUTION LISTS

Respondent: The biggest problem is to get people to look at them. For example, say there is a flagword of -----. When this gets reviewed, if it is no longer valid, no one will delete it because they don't know that it doesn't belong to someone else. So, you really need to be able to have an owner of each individual distribution and there ought to be a means for him to get a listing of everything he has so he can review it and keep it up to date. If you do that then people will maintain them.

14.16 AUTHORS' COMMENT

We feel that the issues raised in sections 14.2, 14.3, 14.6, 14.7, and 14.13 are particularly important with regard to the 1977 test. Although we generally cited a single example to recognize the issue, these same issues were identified by many respondents.

15. MILITARY-PROPOSED FEATURES OF AN OPERATIONAL SYSTEM

Although the central focus of the study reported here is on features proposed for the test service, there is also, obviously, an interest in features beyond the purview of the test. Some such features are mentioned here as considerations for an operational system.

15.1 EXTENDING THE SYSTEM GEOGRAPHICALLY

Respondent: What about a link between CINCPAC and the JCS? Is that in the state of the art?

Interviewer: It is certainly in the state of the art, because, for example, with the ARPANET [Roberts 70] which we now use, we have connections here on the Island at Camp Smith, throughout the Mainland, and also in European countries. So, our present system is sort of a worldwide network and is used for messages and other functions. It is not suitable for your use because of the way people now interface with it, but for computer-trained people it is effective. We would envision, for an operational system (not this test next year) that it certainly ought to encompass Washington as well as other locations. I would think it would be a part of the AUTODIN II system that is being planned. The technology is there. Many of the issues will be organizational, methodological, and political.

15.2 INTERFACING TO OTHER SYSTEMS

Respondent: We're supposed to get a new thing called MESDIS, a message distribution system for data pattern messages, to go right into our computer files.

Interviewer: And this is on which system?

Respondent: Honeywell 6000.

Interviewer: On LDMX?

Respondent: Yes. The data patterns are on 80-column cards.

Interviewer: How are the cards generated?

Respondent: They come from the 5th Air Force or SAC Headquarters.

Interviewer: They come through AUTODIN?

Respondent: Yes, and then we send them out as a message the same way.

Interviewer: Someone here also punches them for an outgoing message?

Respondent: We use what they send us and edit it -- update it in our computer.

Interviewer: How do you do that?

Respondent: How does MOP (Message Output Processor) work?

Interviewer: How do you indicate that you want to update such a message?

Respondent: I run an update after I receive a message. With MESDIS, they really don't have the capability yet, but incoming card messages will go onto my file and I'll be able to access that disk file and run an update and access those very same after-edited transactions and send them on the JCS.

Interviewer: The way you access is by looking at card images on a CRT?

Respondent: Yes.

Interviewer: Many such facilities are possible, including typing into WWMCCS. But that kind of thing won't be available in this test next year. However, if it is on LDMX, then it should not be far away in time since this test service couples to LDMX.

Respondent: Well we get into interfacing problems, but these are things now in the WWMCCS, information slides and things of that kind that you can produce or hardcopy. It would be nice to take that same information and distribute it to the subscribers of this system. Not everyone who has one of these terminals will be on WWMCCS.

Interviewer: With later AUTODIN plans, I understand they may be tied together, but WWMCCS will not be tied into this test next year, in any way.

Respondent: I can see real utility in being able to draft information using our recon information system; it's analogous to MOP. MOP is an existing system we now use in reconnaissance and it permits us to create card images on the screen, edit them and then transmit them. We also have certain recurring, relatively stable, formatted messages such as AIGs, and instead of sending out a message saying delete this guy, add this guy, our practice is to send a recapitulation. It's in MOP and it's great. You don't have to worry about an E2 in someone's comm center failing to update the AIG. It is always correct.

Interviewer: We planned something like that that I didn't mention, like the AIGs, where you can build lists of codes and store them away with a name. Then instead of typing the codes into a message every time, you simply type the name of the AIG list and it is automatically replaced by the associated codes. Would that be useful?

Respondent: Oh, yes. That's nice to have. The AIG, that's essential. You've got to be able to show, on request, who is in an AIG. These are in the LDMX

computer right now. There is another interface problem. We are also able to use GOLDS (General On-Line Display System) which works on WWMCCS. It permits us to go into almost any data base and pull out information (one-time query or repeated query) and build a product which is a particular display. Then we can transfer that to MOP and send it as a message, assuming that it is not more that 80 characters long. Right now that is the limitation. Frequently, we would want to create something in one system and send it by message to others. We do it right now in MOP. So "downstream" you need to think about it.

15.3 SECURITY AND SPECIAL INTELLIGENCE TRAFFIC

Respondent: Our office is unique in that we go through more messages than anyone else in J3. But our overall concern is SI.

Respondent: Take, for example, the command center. Everybody is SI cleared, but only the DDO and the clerk are SIOP, PSI cleared. If you have a setup like this you have to be sure the others don't get in.

Interviewer: Well, the state of the art doesn't allow us to verify and certify the code in the computer. We can do it in very simple sorts of ways -- very simple algorithms, but not in a general way such as with an operating system. We won't be able to do that by 1985 either. And that seems to be a major stumbling block. Although there are pretty good safeguards -- the probability of penetration (deliberately or otherwise) can be made very low as a function of cost.

15.4 DOCUMENT INPUT

Respondent: What I'd like to have in a future system is a "look, see, print." When I feed into the computer, page-by-page, rather than typing, it takes the visual imprint, translates that and reproduces it in whatever fashion. I know the state of the art is there, it is just an expensive proposition.

You are asking questions that will affect the overall operation of an agency such as J3.

Respondent: What about an OCR that could read ordinary documents?

Interviewer: To my knowledge, there are no plans for that kind of facility for this test in 1977. Now, for a follow-on operational system, lots of people have expressed interest in getting other forms of documentation on-line and perhaps that will be a consideration. But it is just not in the plans for this test. But, hopefully, you'll be able to do the intraoffice correspondence.

15.5 LARGE SCREEN DISPLAY

Respondent: Also, you would want to have the capability for the command center to project the display on a big screen for briefings, conferencing, and so forth.

16. CONCLUSIONS

16.1 A RECAPITULATION OF DESIRABLE FEATURES

Below, in summary, we tabulate only numerically rated features and only those that received a mean of 1.0 (desirable) or higher. The most frequently occurring response (the mode) is also given. Remember, though, that many nonnumerically rated features are required.

Feature	Mean	Mode
Point Paper	2.6	3
Programming Events	2.5	3
Automatic Archival	2.4	3
General File Organization	2.3	3
Message Retrieval Specifications	2.2	2
Message Access Based on Two Conditions	2.1	2
File Access Privileges	2.0	3
Automatic Filing	2.0	2
Maintaining Single Draft Version	2.0	1-3
Commenting File Entries	1.9	2
Exempting Messages from Archive	1.9	1
Message Access by Logical Expressions	1.8	3
Commenting the Draft Message	1.8	3
Formatting Message Excerpts	1.7	3
Terminal Linking Facility	1.7	2
Programming Notice	1.6	2
Commenting the Released Message	1.6	2
Field-Specific Draft Comments	1.5	3
Formal Nonmessage Communications	1.5	2
Informal Message Service	1.4	1
Programmed File Instructions	1.3	0-2
Explicit Archival	1.2	1-2
File Header Comments	1.2	1

Those numerically rated or numerically analyzed features that were not desirable included the reordering of message fields, the suppression of message fields, defining excerpts differently for different files, and the application of comments to specific fields of received messages.

16.2 A CHARACTERIZATION OF ESSENTIAL CAPABILITIES

Throughout the report we have given recommendations for minimum and also elaborate capabilities. Below, we characterize the service by listing (in a general way) some major minimal capabilities. This is included for the reader who is not interested nor

has the need for the details. *It in no way supplants our earlier recommendations at the end of most chapters.*

1. The ability to input the text of a message and send it to others for their approval, editing, or comments.

2. An input file such as the pending file to automatically catch all incoming traffic.

3. The ability to explicitly file items in subject files that are defined by the user.

4. The ability to recall items or their excerpts by logical expressions of originator, DTG range, and user-specified keywords supplied by him when filing.

5. Notification that a new message has arrived in the input file.

6. An automatic archive facility.

7. The application of the above to informal notes (excepting archive) and to free-form formal correspondence within the Headquarters. The interactive terminal-to-terminal capability is also needed.

16.3 THE RESPONDENTS' GENERAL ATTITUDES TOWARD THE SERVICE

Would such a service as proposed herein be well received, given proper training conditions and reliable equipment? The answer is yes, emphatically. In terms of their overall attitudes toward the service we described, we can divide the respondents into three groups. Two of the 24 were very pessimistic. Basically, these two gentlemen did not believe a service as described would be useful to them. Their ratings generally ranged from 0 to -3. To insure representation of all attitudes, their remarks appear throughout the report, perhaps out of proportion to their number. A second group of about 6 or 8 of the 24 were highly optimistic. They liked everything about the proposed service and felt that it would help them in their job, perhaps more than it actually would. The remainder, the largest of these three groups, was generally skeptical initially. But throughout the course of the interview, they discovered parts of the service which they believed could greatly facilitate their operations. The members of this group made many useful contributions to our understanding of their needs and to our understanding of the limitations to which the test service would apply.

Perhaps the most common unsolicited responses from most of the subjects identified three needs. One need is to cover their functional needs which extend beyond formal record traffic between distant points. Another need is to be able to reach those persons, beyond J3 personnel, with whom they work daily. And lastly, they need a familar, English-like language for the man-computer interaction. We agree.

136

REFERENCES

[Heafner 75]

Heafner, J. F., *Design of Application-Oriented Languages by Protocol Analysis*, Ph.D. thesis, University of Southern California, 1976.

[Heafner 76]

Heafner, J. F., M.D. Yonke, and J.G. Rothenberg, *Design Considerations for a Computerized Message Service Based on Washington, D.C. Navy Personnel*, ISI/WP-1, May 1976.

[NTP-3]

Naval Telecommunications Procedures: Telecommunications Users Manual, Commander, Naval Telecommunications Command, Washington, D.C., 20390.

[Myer 73]

Myer, T. H., J. R. Barnaby and W. W. Plummer, *TENEX Executive Manual*, Bolt Beranek and Newman, Inc., Cambridge, Massachusetts, 02138, April 1973.

[Roberts 70]

Roberts, L. G., and B. D. Wessler, "Computer Network Development to Achieve Resource Sharing," *AFIPS Conference Proceedings*, Vol. 36, 1970, pp. 543-549.

[WASH-MIC]

Honour, W. W., and R. L. Kossan (eds.), *WASH-MIC: Industrial Military Acronyms*, Rand Company, McLean, Virginia, 1973.